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PACIFIC NORTHWEST Executive

University of Washington
Graduate School of Business
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STRENGTHENING EDUCATION

From the President

The Pacific Northwest Executive is one example of how the University is working with the business community in providing a forum for topics of importance to both sectors. This past June, the Washington Roundtable released its "Report and Recommendations: Higher Education in Washington." The basic fact, recognized by the Roundtable Report, is that the University of Washington has fallen perilously behind its competition in salaries and operating budgets. If this is to be redressed—if the excellence called for by the Roundtable Report itself is to be achieved—substantially larger appropriations are needed for the University of Washington. If this could be done without raising taxes, that would be fine, but there is no reason to believe that this is the case. Dick Page, president of the Washington Roundtable, and Chuck Collins, chairman of the Higher Education Coordinating Board, debate these matters further in the following pages. A third perspective is provided by University of Washington faculty members Jerry Sullivan and Paul Sommers.

William P. Gerberding
President
University of Washington

PACIFIC NORTHWEST Executive

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Product Liability: Beyond the Reach of States

by Alexander B. Trowbridge

Collier-Keyworth Co. in Massachusetts makes children's furniture and infant car seats. Because car seats are mandatory in all fifty states, the product line should be profitable. If, however, the company is forced to drop car seats in order to obtain liability insurance, as one of its competitors was, it could mean the layoff of some two hundred workers, and less choice for safety-conscious parents.

This example typifies the liability crisis that is afflicting the nation. Manufacturers, who have suffered for years, no longer suffer alone. City governments, professional day care centers, schools, hospitals, health clubs, and a host of other institutions are all watching their insurance premiums skyrocket. Often these groups can not obtain liability coverage at any price. A confusing legal system, out of control and spawning endless lawsuits and multimillion dollar verdicts, is to blame. The biggest losers are consumers, as essential products and services become more expensive and difficult to find.

States Take Action

In response to the growing crisis, state legislatures around the country are passing tort reform measures designed to increase the affordability and availability of liability insurance. Last April, Washington state enacted its own package of tort measures and became a leader in the reform movement. The Washington state law pins down soaring legal costs while assuring that persons injured through the fault of others receive appropriate compensation. Though still too early to assess the full impact of the law, which took effect last August 1, several insurance companies such as Safeco and CIGNA Group have begun providing liability coverage to municipalities and other public entities deemed uninsurable over the past few years. Fireman's Fund Insurance Co. has frozen rates for one year until more is known about tort savings.

Washington state's manufacturing community, like its counterparts across the nation, is trapped in a product liability nightmare. Spiraling insurance costs or lack of insurance at any price is forcing companies to make unbusinesslike decisions that are taking an economic toll on society. Some companies, unable to afford or obtain insurance, are going bare—operating without insurance—or going out of business altogether. Other companies are being forced to drop profitable product lines or reject expansion into new lines based on insurance considerations. Raising prices to meet insurance costs and adding product liability surcharges are other ways companies are coping. Multi-Metal Wire Cloth, Inc., of Tappan, New York, adds a $10 product liability surcharge to every invoice, regardless of the dollar amount. This manufacturer has never had a product liability claim in its seventy-five year history, yet it has had a 300 percent increase in its annual insurance premium.

The specter of product liability stymies risk taking and innovation. Jobs are being lost or not created. Manufacturers and wholesalers in Washington and other major exporting states, already facing stiff foreign competition, have yet another unnecessary cost that puts their products at a disadvantage. Many of these companies are digging into profit, normally reserved for expansion or improvements, to cover insurance costs because competition will not allow a consumer price increase to offset higher premium costs. Some companies can not obtain financing because product liability costs and risks are too difficult for a financial institution to assess. Other companies are unable to bid on government contracts because they can not assume liability coverage of their products.

The price society pays goes beyond economics. The development of new products that improve the quality of life and enhance life expectancy is being hampered. Critical childhood vaccines such as DPT and polio are now being produced by only two companies because of the product liability threat. WEPCO, Inc., an innovative manufacturer of driving aids for the handicapped, with no history of lawsuits, saw its product liability insurance costs increase from $1,400 in 1985 to $18,000 in 1986. The company went out of business.

In Washington state, legislators included several provisions in the new tort law to provide product liability relief to manufacturers. These include a reasonable cap on awards for pain and suffering, limits on the "deep pocket" approach associated with "joint and several" liability, and a new system allowing periodic payments of economic damages that exceed $100,000.

However, the focus of Washington's new law is not product liability, but rather broader tort reform concerns of a coalition of municipalities, schools, hospitals, and other public entities. The manufacturing community supported the broad reforms, but in general did not push for increased emphasis on product liability provisions. Why? Internal political dynamics was one reason. More important, however, was recognition of the fact that the product liability crisis is beyond the reach of states.

The reason is simple enough. Products, wherever they are manufactured, do not always remain in the state where they are made. When a Weyerhaeuser or a PACCAR or even a small furniture maker in Olympia manufactures a product, there is no guarantee it will be sold or used only in Washington state. In fact, some 70 percent of the goods manufactured in Washington enter interstate commerce to be consumed overseas or in other states. In addition, each of the fifty states and the District of Columbia has varying and often conflicting rules governing product liability standards and manufacturers' liability. Imagine the chaos when a Washington manufacturer is sued by a citizen of Oregon for a product-related accident that took place in California, with a decision perhaps influenced by state court verdicts in several other states.

With fifty differing state product liability codes, the legal system remains confusing and unpredictable for manufacturers, wholesalers, retailers, consumers, and insurance companies. The ambiguities and inconsistencies feed the "sue 'em" mentality currently so prevalent in the United States. Today, lawsuits are just about as unavoidable for U.S. manufacturers as the proverbial death and taxes. The number of product liability suits filed in federal district courts alone jumped from 1,600 in 1974 to 13,554 in 1985. Though specific numbers are not available, the National Center for State Courts estimates that the number of cases filed in state courts has increased 20 percent or more over the past seven years.

Jury awards are also escalating at a breathtaking rate. Product liability awards tripled over the past decade according to Jury Verdict Research. In 1974, the average jury award was $346,000; by 1984, it had climbed to $1.1 million. Yet these figures do not represent a windfall for claimants; lawyers typically scoop up 30 to 50 percent of the final awards. Under the "contingency fee" system, claims are escalated in hopes of settlements at inflated levels, a large percentage of which goes to the plaintiff's lawyer.

Unfortunately, reform measures such as Washington state's serve as an isolated band-aid, offering limited relief but no permanent cure for the national affliction. Insurance rates will remain high, and availability of coverage low, as companies are forced to adjust rates to take into account the maximum amount of liability to which a manufacturer, wholesaler, retailer, or municipality could be subjected under the fifty-state system. Washington did the right thing, but can not gain full benefit from it until all other states have similar limits on risk.

Attempts by states to regulate the insurance industry won't work either. This is blaming the messenger for the message. In Florida, for example, instead of increasing the availability of insurance, tighter regulation discouraged nearly twenty companies from issuing new coverage; an equal number have sued, charging that the new law is unconstitutional.

Federal Law Needed

The only bright spot in this disastrous situation is that the system can be fixed. Fifty differing state reforms will not do the trick. A federal product liability law, however, would provide the uniform standards necessary to restore sanity to the system. A single set of rules can offer much more in the way of predictability than a set of fifty.

I have talked to hundreds of manufacturing chief executives around the country who are convinced they need some uniform and reasonable guidelines under which they can design and manufacture quality products that are competitively priced. They do not want to gut product liability law; what they do want is some clarity and continuity. The interstate commerce clause of the U.S. Constitution provides the basis for such a national approach to the problem.

The nation's small business community echoes the same concerns. Last August, some eighteen hundred delegates to the White House Conference on Small Business chose the adoption of a uniform federal product liability code as their number one recommendation to help small business stay strong and expand in this country and the global marketplace.

Even the nation's governors—who do not often agree that the best solution to a problem lies with congressional action—have endorsed federal product liability reform. Though historically opposed to federal preemption of state laws, the governors last summer overwhelmingly called for federal legislation to curb the product liability crisis.

Unfortunately, opposition to federal reform has been fierce. The Association of Trial Lawyers of America relentlessly flexed its political muscle to prevent federal product liability reform during the last few sessions of Congress. Last year we came closer to a federal solution than ever before. Late in September, just before adjournment, the Senate showed overwhelming support for the reform bill in procedural votes. Though far from perfect, the bill made a number of excellent reforms. In the end, however, the measure fell victim to the pre-adjournment rush to consider pressing budget and tax legislation.

Although timing and election year politics impeded final action in the Senate last session, the issue is not going away. Senators are now well aware of the need to adopt uniform, national product liability standards. Working with other business associations, the National Association of Manufacturers (NAM) mobilized thousands of member companies to call, write, telegram, and visit their representatives throughout the year. State tort reform initiatives around the country carried the message even further. Last year's efforts should set the stage for the adoption of sorely-needed federal legislation in the 100th Congress. On behalf of our thirteen thousand member companies, the NAM will continue to promote a number of crucial provisions.

A first priority is a fault-based standard of liability. Manufacturers should only be held liable if there is evidence of negligence in the design, production, or distribution of a product that renders it unreasonably dangerous. A manufacturer or product seller should not be held liable for mishaps resulting directly from misuse or unpredictable actions of the claimant. The trend, however, has been toward use of strict liability as the standard to determine "fault." Under strict liability, a manufacturer currently could do everything technologically feasible to develop and manufacture a safe product and still be found "guilty."

A second priority for manufacturers is the elimination of joint and several liability. Under this legal doctrine, any parties found jointly responsible for an injury could end up paying the entire amount of the claimant's award. Claimants are allowed to reach deeper into the pockets of defendants who can afford to pay damages to cover for those who can not. The NAM believes contribution among jointly liable parties should be based on comparative responsibility for the injury, and not on the deep pocket's ability to pay. The deep pocket mentality is simply unfair and inconsistent with a tort system that should seek to pinpoint actual responsibility.

In addition, the NAM believes federal law should do the following:

- eliminate capricious litigation by making parties pay for the other side's legal costs if suits are found to be unwarranted;
- award punitive damages only if a manufacturer or seller acted maliciously, and put an upper limit on the amount;
- consider whether plaintiffs were in any way responsible for their injuries, with damages reduced proportionately;
- allow evidence of a plaintiff's other sources of recovery such as health insurance or workers' compensation as offsets for the plaintiff's net economic losses;
- establish a reasonable statute of limitations;
- and develop clear guidelines on product warnings and labels.

The product liability crisis has finally grabbed the attention of Congress, due in part to reform initiatives of Washington and other states around the country. This year, we must all continue to push hard for fair and uniform federal standards. The need is clear and immediate. Without such a law, the nation could sue itself out of business.

Alexander Trowbridge is president of the National Association of Manufacturers.

Liability Laws: Preserving Individuals' Rights

by Ralph Nader

One morning in the summer of 1986, just before a Senate Commerce Committee markup session on the federal product liability legislation, I called up Senator John Danforth (R-MO) and Senator Robert Kasten (R-WI) to ask for their best estimate of the total dollars in product liability awards and settlements, federal and state, in any given year or recent period. Since these two Senators have been advocating for several years the extreme position of federally regulating state judges and juries because of their concern over the economic impact of such decisions and settlements, I thought they would have some quantitative parameters of the problem. Senator Danforth replied, "I don't know." Senator Kasten answered, "I have no idea."

Our best estimate is that less than $2 billion a year is won by victims of defective or dangerous products. The unwillingness of the insurance industry, which supports the Danforth-Kasten legislation, to produce more precise data of their payouts to victims is typical of the entire insurance greed crisis of 1985–87, a campaign of unsupported assertions designed to restrict victims' rights.

The Boom and Bust Insurance Industry

Insurance companies are supposed to be full of data; instead they have been full of unrepresentative, distorted, or phony anecdotes to camouflage the basis for the sharp increases in insurance premiums, reductions in coverage, and arbitrary cancellations. Trucking firms, corporate officers and directors, day care centers, and other small businesses have found that their premiums have increased two to tenfold with less coverage even though they have had a claim-free history. Insurance agents have told me of their unease in having to explain premium rises that were not based on loss data. The nebulous expectation of future claims, not the record of past actuarial experience, has become the upward pull factor.

In all the controversy during the past two years, there is one area of remarkable agreement. In March 1986 Maurice R. Greenberg, president and chief executive officer of American International Group, Inc., told an insurance audience in Boston that the cause of current industry problems was "price cuts to the point of absurdity" in the early eighties. Had it not been for these cuts, he said, there would not be "all this hullabaloo about the tort system."

When interest rates were high, the industry cut prices and insured poor risks in order to obtain premium dollars to invest. When interest rates, and thus investment income, dropped, the industry responded by sharply increasing insurance premiums and reducing availability. A leading stock analyst recently described the boom and bust nature of the industry "as predictable as the tide in a three-year swing from flood to ebb."

J. Robert Hunter, Federal Insurance Administrator under Presidents Ford and Carter and now president of the National Insurance Consumer Organization (NICO), testified before Congress in early 1986 that ". . . 1984 was a typical 'bottom-of-the-cycle' year. The last time it happened was in the mid-seventies. . . . At that time, the country observed the precise phenomena we see today." Hunter added, "At the top-of-the-cycle a few years ago, the now-dreaded liability insurance policy rates were being slashed wildly and even being sold after the insured event happened." Similarly, *The Wall Street Journal* recently reported, "The insurers' problems were caused in large part by an unprecedented six-year rate-cutting war that began in the late seventies."

While former New Jersey Insurance Commissioner Hazel F. Gluck referred to the industry's "financial mismanagement," the insurance companies were suddenly discovering all kinds of "crises." Starting in early 1985, the insurance trade press began reporting speeches and statements by insurance executives about the "malpractice crisis," the "product liability crisis," the "lawsuit crisis," and the "unpredictability crisis."

The latter "crisis" referred to allegedly tumultuous judicial decisions that were suddenly discovered to be beyond the bounds of actuarial science to predict. One would think that judges had imposed a standard of absolute liability which, of course, they had not. Strict liability came into the common law of product liability during the sixties. Plaintiffs still had to prove that the product was defective and that it caused the injury. A violated standard of care still needs to be shown, but the company's negligence does not need to be proved.

The defendants' lobby wants compliance with government standards and industry practice to be automatic defenses against plaintiffs' claims for recovery. However, the history of product safety shows repeatedly that these government standards are often taken from industry codes and are weak or obsolete when issued. The federal tire safety standards, for example, were issued in 1968 and have not been updated. The industrywide standard itself can be negligent, as the courts have recognized since Judge Learned Hand's decision in the T.J. Hooper case in 1932.

It is true that the liability exposure of companies manufacturing hazardous products has increased over the past eight decades. Our social values place greater premiums on human health and safety now than in the late nineteenth century when railroads made decisions on the basis that trainmen were cheaper than automatic couplers and other investments. Insurance companies' premiums are much larger now, and the capability to build safety into the product and detect defects is far more advanced.

For the insurance industry to say that these gradual common law developments are making insurance unavailable and unaffordable is to contradict the considerable growth of insurance assets, surplus, and profits, especially during the current boom that started in 1985. Insurance lobbyists have been cool to legislation that removes obstacles to self-insurance pools. They are also opposed to banks moving into insurance. These two positions do not conform with the industry's concern over lack of availability.

Insurers should not be pushing to restrict victims' rights as a response to any new risks they do not choose to cover. The economic position they advocate should not affect the human rights to health and safety justice. When government started crop insurance or flood insurance or bank deposit insurance, the rights of the people shaped the mode of insurance when the private market bowed out or was too expensive for consumers.

The cost of one million tort lawsuits filed in 1985, according to the Rand Corporation Institute for Civil Justice, was between $27 and $35 billion. This sum covers compensation to claimants, legal fees, related expenses on both sides, insurance companies' processing costs for claims and suits, and the value of litigants' time. By comparison, U.S. consumers spent $39 billion on soft drinks, $32 billion on tobacco, and $60 billion on alcohol; doctors grossed $80 billion and General Motors grossed $96 billion. If you add all compensation, including workers' compensation payments, from the insurance industry to victims, the total is $65 billion or 1.7 percent of the GNP—less than what people spend on soft drinks and cigarettes, or far less than what is spent on GM products and services. Given the priorities that should claim a society's funds, compensating injured and sick people should be high on the list and is affordable.

Stifling Common Law?

The tort system, however, is much more than a compensating system. It deters and discloses wrongdoing, and expands the ethical obligations between parties in a technologically and institutionally changing society—obligations of perpetrators to victims, sellers to buyers, employers to employees, and corporations and communities to future generations. In recent serious megacases such as the asbestos and Dalkon Shield litigation, the reach of the tort discipline has changed boards of directors, moved companies into voluntary bankruptcy, and shaken executives who were unable to hide behind their corporate curtain. Deterrence and disclosure in these and the Pinto and Firestone 500 radial tires cases sent shock waves through companies, upset bureaucratic controls, and informed millions of people about the dark side of the product marketplace.

In contrast, disclosures do not often come from the regulatory agencies; indeed, the revelation of unsafe product and practices from testimony, depositions, and other discovery processes of judicial cases has stimulated stronger legislative and regulatory action. Twenty years ago, for example, Senator Gaylord Nelson succeeded in getting through Congress a law establishing minimum tire performance safety standards, using data and sworn testimony from a 1965 lawsuit brought by an injured plaintiff against a major tire manufacturer. Since corporate influence over the Congress and the regulatory agencies during the Reagan Administration has been decisive, it is not surprising that the defendents' lobby has turned its attention to the one arena where an average worker, consumer, or child has a fighting chance to hold corporations, large or small, responsible for the damaging effects of their products.

How much easier it is to establish a supreme federal code that would preempt the common law in thousands of state courtrooms where judge and jury decide cases on their facts. A federal product liability law would also be more amenable to campaign contributions and other nonmeritorious influences that are prohibited from working on the courts. It would also, in the name of spurious federal uniformity, lower the level of protection given to injured and sick people under fifty state jurisdictions.

Deciding justice in a case of personal injury is a task for the judiciary to perform without arbitrary limitations on compensation and forms of damages. This was the ruling of U.S. District Judge James H. Michael, Jr. on November 5, 1986, in striking down Virginia's law capping medical malpractice awards. Judge Michael held that caps both infringe on a citizen's right to a jury and impermissibly interfere with the functioning of the judicial system.

Justice should not be prejudged by legislative ceilings. Personal injury cases in the courts are decided on their individual merits because they are all individual in their degree of severity and defendant's behavior. A federal product liability law would freeze the evolving potential of the common law and subject important human rights to a remote political process in Washington, D.C.

A federal product liability law has been on the agenda of the insurance industry, the manufacturers and other sellers of defectively designed or constructed products and toxic chemicals, and the Reagan Administration. The single, unchanging characteristic of these federal proposals is the reduction of existing protections and rights, which state laws throughout the country now grant, of persons injured by products. For example, the Reagan Administration's proposal, sponsored by Senator Kasten, would limit pain and suffering and punitive damages to $100,000 per injury, penalizing the most seriously injured victims by dramatically undercompensating them for loss of limbs, reproductive organs, or dignity caused by defective products. A fixed recovery cap would reward the most reckless manufacturers of dangerously defective products, thereby reducing marketplace incentives to produce safer products.

Close to the end of the 1986 legislative session, the insurance industry and corporate defense lobbies succeeded in forcing a federal product liability bill out of the Senate Commerce Committee. Although not as cruel as the Reagan Administration's proposal, this bill would have also undercompensated the most devastatingly injured victims. The legislation provided an unfair choice to the injured party. If a manufacturer offered to pay an injured victim's out-of-pocket expenses plus $100,000 for pain and suffering caused by any permanent impairment resulting from the injury, a plaintiff who rejected the offer would face an automatic cap of $250,000 on the amount recoverable at a subsequent trial. The worst wrongdoers would be able to limit their liability simply by making an offer; the most severely injured victims would be penalized because they would be automatically undercompensated for their losses. Strongly opposed by many committee members, state officials, judges, law professors, and consumer groups, the bill was pulled off the Senate floor after a threatened filibuster by a number of Senators.

The compassionate evolution of our common law has deterred unsafe practices, disclosed dangers to a wider public, and expanded respect for human life that distinguishes our country from most other nations. It is the means of protection for tens of millions of Americans who are less likely to be injured because of the impact of lawsuits brought by victims. It helps nonvictims live in a safer and more healthful society, and allows society to grow in response to societal needs.

Spending $27 to $35 billion in 1985 to deal with all injuries and sicknesses under the insurance/tort compensation system, given the horrendous nature and volume of injuries and illnesses resulting from corporate, and other defendants' wrongdoing, is not a national crisis. We need more corporate accountability, not less, and we need to have it community based—not written in stone in Washington, D.C. ılı

Ralph Nader is a lawyer and has been a consumer advocate based in Washington, D.C. for over twenty years.

REGION
WATCH

Economic Developments in the Pacific Northwest

Slow growth with a low rate of inflation characterized the national economy in 1986, and the same is likely to be true of the new year. GNP, employment, personal income, and inflation all increased at a bit less than a 2.5 percent rate in 1986. Some signs of a turnaround in the foreign trade sector were apparent by August and September, with imports falling significantly and exports increasing modestly. The fall in the value of the dollar internationally gives hope that a stronger export sector can lead the national economy in 1987.

The new tax law may have caused consumers to shift some purchases from early 1987 back to late 1986 in order to take advantage of the last year of sales tax deductibility. Similar influences related to other elements of the new tax code are affecting business capital formation. Consequently, the fourth quarter of 1986 looks better for tax reasons, while the first quarter of 1987 is likely to suffer. Economic conditions should gather momentum as 1987 progresses, and the negative transitional effects of the code changes wear off.

The Pacific Northwest should do at least as well as last year and, for the first time since 1980, the region should do better than the nation. The forest products sector should continue its recovery, buoyed by favorable housing demand, improved cost conditions, and probably some protection from Canadian lumber imports. Boeing reported strong earnings and sales for the first nine months of 1986, up 21 percent over the comparable 1985 figures. Although further employment gains will be modest, 1987 should be a good year as well. The agricultural sector can look forward to slightly improved prospects in export markets. The Dalles aluminum plant has reopened, increasing employment in that industry. BPA's new variable rate policy was a major factor in reopening this plant under new ownership. The convention center, bus tunnel, I-90, and commercial building projects in Seattle, and the initial expenditures of $43 million on the Puget Sound home-porting program of the U.S. Navy should lend strength to the construction sector in Washington.

One of the areas of uncertainty is oil prices. With recent policy and personnel changes in OPEC countries, a pattern of modest increases in oil prices is likely. If so, the Bonneville Power Administration will see some recovery of markets for secondary power in the Southwest. The previously expected reduction in Alaska oil exploration activity may turn out to be less severe, too. Any increase in economic activity in Alaska is good news for Washington, where many products bound for Alaska are produced and through which the majority of Alaska-bound goods travel.

It remains to be seen what the expected changes in the balance of trade will do to Pacific Northwest ports. Seattle, Tacoma, and Portland handle a great deal of imported cargo: automobiles and high-value containerized goods. A reduction of imports nationally will surely cut the volume of imports handled in these ports. On the other hand, a revival of exports should mean more grain and logs being handled by a variety of ports along the Columbia River. Negative GNP growth rates in Japan could be a damper on export growth, but more expansionary monetary policies are now in place there.

As of this writing, one of the most significant developments in the U.S. political economy is the shifting of the Senate from Republican to Democratic control. A number of issues affecting the regional economy will be wrestled with by the new Democratic-controlled Senate: the federal government deficit, military spending, protectionist issues, the fate of the Bonneville Power Administration, funding for local water and sewer projects, and the nuclear repository siting process. With the influence of the Pacific Northwest's delegation decreasing relative to the previous Congress, and the overall political climate changing, the new Congress will almost certainly be less favorably disposed to this region's interests.

The Weyerhaeuser Company's new profit-sharing plan has produced bonuses for workers at a number of its mills. Under the terms of the contract negotiated this last summer with two unions, one-third of profits above the first 5 percent goes to the workers. Oregon workers received bonuses totalling nearly $560 million. These bonuses were distributed at eleven profitable mills in Oregon, while workers at three less profitable mills received no bonuses. In Washington, a total of $355 million in profit-sharing bonuses went to employees at five of the company's seven lumber and panel plants. Some workers in administrative positions and logging crews also received productivity bonuses, bringing total bonuses in Oregon and Washington to $1.42 billion. Both company and union officials note an increased attention to cost and productivity issues in the mills.

Washington's Timber Economy

by Barney Dowdle

In our last issue, public and private sector representatives addressed major issues facing the forest products industry in the Pacific Northwest. University of Washington forestry economist Barney Dowdle responds with additional considerations for the industry in Washington.

Contemporary analyses of Washington's timber industry tend to follow a standard format: the industry has recently endured a severe economic crisis; following some painful retrenching and restructuring, the industry is now "lean and mean"; and a reasonably firm foundation now exists from which to launch an aggressive sales and marketing campaign for wood products, especially among Pacific Rim countries. The popularity of this analytical genre is understandable. Corporate managers are rightly concerned about the prices of their stocks, and officials of state and local government are concerned about their bond ratings.

There is, however, an alternative interpretation that needs airing. The recent flurry of economic activity in Washington's timber industry may reflect a quickening of the capital flight that has been occurring in the industry for some time. It is well known that Washington-based wood products firms have been shifting new investments elsewhere, especially to the South. Local firms have also been depreciating milling and logging equipment without replacement.

More recently, a number of firms have increased rates of timber harvest to levels that are depleting timber inventories and are, therefore, unsustainable. Unless the inevitable fall in the total private rate of harvest is offset by increases in timber harvest rates on public lands, less timber will be available to process. The prospect for this occurring seems unlikely. U.S. Forest Service planners, in fact, anticipate a 15 to 20 percent decline in timber outputs from the national forests. The state's timber economy could be facing a relatively bleak economic future.

Background

Washington does have the timber resources to have an expanding and flourishing timber industry. The softwood sawtimber inventory in the state, the principal raw materials base of the industry, is only 8 percent less than that of the South, our major regional competitor.

Why do firms leave the state when there is so much timber here? A major reason is that Washington is handicapped with some flawed institutional arrangements that prevent its economic potential as a timber producer from being realized. Public timber management and marketing policies create uncertainty and disrupt timber markets. Investors, therefore, are reluctant to invest in wood-processing facilities that are significantly dependent upon public timber supplies. As public timber supplies have increased in importance relative to private supplies, the timber industry has encountered increasing economic difficulties.

Slightly more than half of Washington's approximately 18 million acres of commercial timberlands is publicly owned. Within this category of ownership, 5.4 million acres are federally owned, 1.5 million acres are located on Indian reservations, and 2.1 million acres are state lands, which are managed by the Washington State Department of Natural Resources (DNR).

Historically, Washington's timber industry was based on privately owned, old-growth timber inventories. For a number of reasons, private stands of old-growth timber were harvested first. As private stands of old-growth timber were liquidated, demand increased for publicly owned timber. To some extent, this shift in demand is transitory. Demand would be expected to shift back toward private supplies as young stands on previously cut-over private timberlands mature.

Management goals for publicly owned timberlands are based on a range of economic, social, and environmental objectives. Tradeoff decisions among these objectives, where they are conflicting, are commonly politicized, hence controversial. Recent examples include controversies between timber harvesting and, on the other hand, wilderness preservation, spotted owl sanctuaries, eagles' nests, water quality, and the protection of fisheries resources. The latter land uses preclude or, at a minimum, restrict timber harvesting activities.

As Washington's wood-processing industries have become more dependent upon public timber supplies, private sector managers of both wood-processing facilities and tree farms find themselves increasingly embroiled in political and bureaucratic controversies. Many operators of wood-processing facilities have no alternative to public timber, and private tree farmers commonly find themselves under pressure to emulate public management practices.

A point commonly lost in these debates is that competing in timber markets dominated by public timber is riskier than relying on private sources of supply. Additionally, private tree farmers have to pass the test of the marketplace and many public managers do not, especially those who manage national forests. While these points may get lost in political debates and in media coverage, they are not overlooked by investors in the timber industry. If capital costs are higher, then capital holdings and new investments will be reduced.

Public Timber: Key to Competitive Advantage

In Western Washington, where Washington's timber industry is concentrated, trees over seventy-five years old are largely in public ownership. About 90 percent of this timber is on the national forests and is managed by the U.S. Forest Service. Most of the remaining 10 percent is managed by the DNR. Relatively negligible amounts are in municipal and Indian tribal ownership.

Solid-wood products such as lumber and plywood are manufactured from old-growth timber and are, in general, of a higher quality than products manufactured from younger timber. Most log exports, especially those to Japan, have also been produced from old-growth timber.

As privately owned old-growth timber has been depleted, there has been a shift in product mix. Fewer high quality products, in which Washington has historically had a competitive advantage, are being produced. Also, Korea and mainland China have entered the market to buy smaller, lower quality logs.

Increasingly, Washington producers are

being confronted with the following choices: (1) producing high quality wood products from publicly owned timber, (2) producing lower quality products from young, privately owned timber, or (3) leaving the state. The first of these alternatives is an attempt to continue to exploit Washington's historical competitive advantage, even though operators must compete in high-risk public timber markets. The second choice places producers in more direct competition for low-grade wood and wood products with other sources such as the South, the "virgin" stands of relatively low quality timber in Siberia, and the plantation forests in Chile and New Zealand. Additionally, they must face regulatory threats, which tend to be higher in Washington because of public ownership and the politicization of timber production and processing activities. A number of firms, or at least branches thereof, are opting for the third alternative and are leaving.

Conclusions

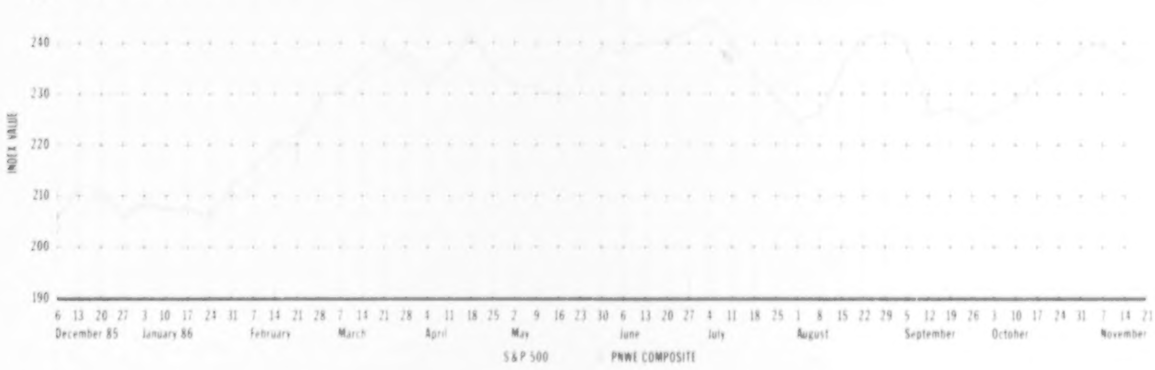
Until the early eighties, rising timber prices masked a number of serious deficiencies in Washington's forest policies. The most serious of these deficiencies has been in the management of the national forests; however, problems have also existed in the management of state lands by the DNR and in the taxation and regulation of private timber production. Since a resumption of the upward trend in timber prices now appears unlikely, these policy deficiencies must be corrected or Washington's timber industry is likely to continue in a relatively anemic economic condition.

Public agencies and forestry academicians have incentives to skirt these issues; they are mindful of the adage "don't bite the hand that feeds you." Industry analysts, and especially government affairs specialists, are also cautious. Criticism of public agencies could lead to higher costs in the execution of public timber-cutting contracts, or precipitate adverse political actions by environmentalists.

In the meantime, Washington faces further losses of income and employment in one of its most basic industries. It would seem timely and potentially beneficial for the state if analysts, who do not represent special interests and have no incentives to assume that existing institutional arrangements are fixed and inviolable, would take a look at these issues.

The Pacific Northwest Executive Stock Index

S&P 500 and the PNWE Index



The Pacific Northwest 66: Firms Included in the Pacific Northwest Executive Stock Index

■ Large company (over $1 billion in aggregate value)
▲ Small company (under $50 million in aggregate value)

Manufacturing
The Boeing Co. ■
Boise Cascade Corp. ■
Bohemia, Inc.
EMF Corp.
(Dropped 9-26-86 due to inactivity)
Hecla Mining Co.
Linden, Inc. ▲
Longview Fibre Co.
Louisiana-Pacific Corp.
Morrison Knudsen Corp.
NIKE, Inc.
PACCAR, Inc.
Penwest ▲
Pope & Talbot, Inc.
Precision Castparts Corp.
Timberland Industries
Trus Joist Corp.
Univar Corp.
Weyerhaeuser Co. ■
Willamette Industries, Inc.
(3 for 2 stock split 5-16-86)

Utilities
Cascade Natural Gas Corp.
Idaho Power Co.
Northwest Natural Gas Co.
Pacificorp ▲
Pacific Telecom, Inc.
Portland General Electric ■
Puget Sound Power & Light Co. ■
Washington Energy Co.
Washington Water Power Co.

Finance
First Farwest ▲
Moore Financial
Old National Bank Corp. ▲
Pacific First Financial Corp.
(Added 7-3-86)
Pacwest Bancorp ▲
(Dropped 11-14-86, acquired by Key Bank)
Peoples Bank
Puget Sound Bancorp
(2 for 1 stock split 8-29-86)
Rainier Bancorporation
Safeco Corp. ■
Savings Bank of Puget Sound
(Dropped 7-3-86, merged with Puget Sound Bancorp)
United Savings Bank
(Added 11-14-86)
U.S. Bancorp

Technology
Data I/O Corp.
Electro Scientific Industries, Inc.
Floating Point Systems, Inc.
Flow Systems, Inc.
John Fluke Mfg. Co., Inc.
ISC Systems
Immunex
Integrated Circuits, Inc. ▲
Intermec
Key Tronic Corp.
Mentor Graphics Corp.
Microsoft Corp.
(Added 3-14-86, went public)
Tektronix ■

Retail
Albertson's, Inc. ■
GranTree Corp. ▲
Nordstrom, Inc. ■
(2 for 1 stock split 6-20-86)
Pacific Gamble Robinson
(Dropped 6-6-86, went private)
Pay 'N Pak Stores, Inc.
Pay-N-Save
(Added 8-29-86, went public)
Weisfield's Jewelers ▲

Other
Airborne Freight Corp.
Alaska Airlines, Inc.
Burlington Northern Inc. ■
Coeur d'Alene Mines Corp.
International King's Table, Inc.
Northern Air Freight, Inc. ▲
Sea Galley Stores, Inc. ▲
Thousand Trails, Inc.

Boeing: The Pacific Northwest's Heavyweight

The economy of the Pacific Northwest, and especially of Washington, is dominated by an industrial giant, The Boeing Company. Boeing is the single largest private sector employer in the region, a significant source of tax revenue, a stimulus to higher education programs, and a major source of new technology in an increasingly technologically-oriented economy. With facilities in Seattle, Renton, Kent, Everett, and Moses Lake in Washington, and Portland and Boardman in Oregon, Boeing's impact on the Pacific Northwest is widespread. It is also a major company nationwide with large facilities in Wichita, Kansas; Philadelphia, Pennsylvania; Huntsville, Alabama; New Orleans, Louisiana; and Dallas, Texas. Boeing dominates the commercial airliner market worldwide, and is a major defense contractor in the United States as well. How did this giant grow in our backyard, what are its prospects, and to what degree does it determine the fate of Washington's economy?

A Short History

The company was started by William E. Boeing under the name Pacific Aero Products Co. in 1915, with a seaplane as its first model (see Figures 1 and 2). Two years later the U.S. Navy ordered fifty seaplanes, and the company was reorganized as Boeing Airplane Co. Significant growth over the next twelve years included the acquisition of one subsidiary (Hamilton Metalplane Co.) and the launching of a Canadian subsidiary, Boeing Aircraft of Canada, Ltd. in Vancouver.

The next major development was a successful bid for the San Francisco–Chicago air mail route. Boeing Air Transport was organized to operate twenty-four Model 40A mailplanes on this route. This operation evolved into United Airlines in 1929 when a holding company brought Boeing and several other well-known companies together under one umbrella. The holding company was split up in 1934 as a result of antitrust concerns. The dissolution resulted in the merger of the Stearman Aircraft Company into Boeing, providing Boeing with its Wichita manufacturing plant.

William Boeing, chairman of the holding company, also retired in 1934. He was succeeded by Claire L. Egtvedt at the helm of the again independent Boeing Aircraft Company. As president, and then chairman of the board, Egtvedt guided the company through the next thirty years. Egtvedt also brought in William Allen, the company's outside legal counsel, as president in the late forties. Egtvedt and Allen then led the company through the succession of corporate gambles that brought Boeing into the jet age. Allen succeeded Egtvedt as chairman in 1968, and then retired in 1972. President in 1968, T.A. Wilson became chairman in 1972, a position he holds today. In an economy accused of an increasingly short-term bias and characterized by frequent management turnovers, The Boeing Company is a model of stability with four long-term leaders over a seven–decade history.

At the end of WWII, a rapid demobilization resulted in the shutting down of many aircraft plants and the withdrawal of many of the wartime producers from the business. One of the few aircraft producers to survive was Boeing, which moved aggressively to develop new commercial and military models.

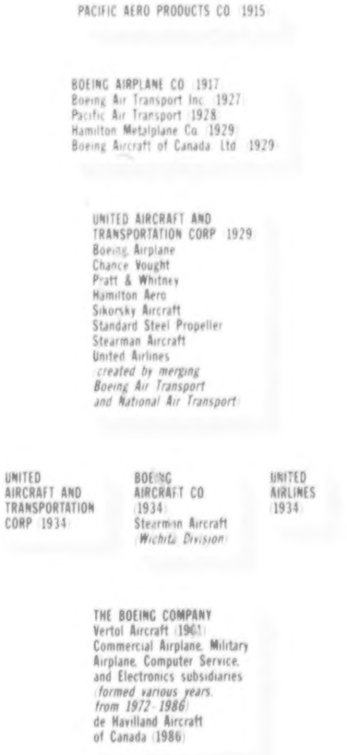
Development of the 707

Boeing was not alone in seeing the potential of jet-powered commercial airliners. The British pioneered the new engine and airframe technologies with the development of jet fighters during the war and the Comet jet airliner afterwards. The Comet suffered from design deficiencies that resulted in several of these planes disintegrating in flight after they went into commercial service. This setback ended Britain's early domination of the jet airliner field.

Boeing was first among U.S. manufacturers to get a jet-powered airliner into the air. Drawing upon experience with the B-47 and the B-52 jet bombers, Boeing jet transports were developed through a dual-purpose military/civilian design. The KC-135 military tanker and the civilian 707 airliner bear many resemblances, although separate design teams worked on the specific designs. The 707 was introduced in 1957, eighteen months after its military cousin. Douglas introduced the DC-8 only months later (in May 1958). The General Dynamics Convair 880 entered service in 1959. Lockheed initially kept out of the jetliner races, staying with its turboprop Electra.

At the end of WWII, few U.S. firms had experience with the jet-engine technology pioneered in Germany and Great Britain. Only two companies made an effort at that time to develop jet engines to complement the new airframes. Pratt & Whitney came to dominate the commercial end of the business; General Electric initially concentrated on military engines.

Figure 1: Boeing Corporate History



PACIFIC AERO PRODUCTS CO (1915)

BOEING AIRPLANE CO (1917)
Boeing Air Transport Inc. (1927)
Pacific Air Transport (1928)
Hamilton Metalplane Co. (1929)
Boeing Aircraft of Canada, Ltd. (1929)

UNITED AIRCRAFT AND TRANSPORTATION CORP (1929)
Boeing Airplane
Chance Vought
Pratt & Whitney
Hamilton Aero
Sikorsky Aircraft
Standard Steel Propeller
Stearman Aircraft
United Airlines
(created by merging Boeing Air Transport and National Air Transport)

UNITED AIRCRAFT AND TRANSPORTATION CORP (1934)

BOEING AIRCRAFT CO (1934)
Stearman Aircraft
(Wichita Division)

UNITED AIRLINES (1934)

THE BOEING COMPANY
Vertol Aircraft (1961)
Commercial Airplane, Military Airplane, Computer Service, and Electronics subsidiaries
(formed various years, from 1972–1986)
de Havilland Aircraft of Canada (1986)

Source: M.J. Hardy, *Boeing*, New York: Beaufort Books, Inc., 1984

The 727 and 737: Best Sellers

The debut of the 707 did not bring immediate financial fortune to Boeing; years of sales were required to amortize the development costs. Commercial orders came slowly for Boeing because the airlines had overextended themselves in the fifties with earlier orders for propeller and turboprop aircraft. Military orders were declining, too. Although the development costs for the 707 were straining the company's financial capacity in 1961, Boeing began development of smaller jets to compete with propeller craft such as Lockheed's Electra and new jets from Europe, the Caravelle and the de Havilland Trident. The 727 design was the result. Douglas followed suit with its DC-9. Several years later, Boeing countered with the somewhat larger 737.

These smaller jets proved profitable on a wide variety of routes and the airlines ordered them in bulk. A total of 1,832 of the 727s and 1,275 of the 737s have been built. Boeing's five thousandth airliner was rolled out in August 1986; it was an updated version of the 737 design.

While Boeing coped well with the strains of growth, Douglas foundered under them as it struggled to expand production of the DC-9 to keep up with orders. The company failed and was merged with McDonnell in 1966. General Dynamics sold few Convair 880s and tried to gain market position by introducing a more advanced model, the Convair 990. Even fewer of these airplanes were sold, and the company left the commercial airliner business in the mid-sixties.

The 747 Bet

Military contracts were instrumental in developing the giants of the sky. The Boeing 747 and the somewhat smaller McDonnell Douglas DC-10 and Lockheed L-1011 were extensions of designs the airframe builders had produced in competition for the military's giant C-5A transport contract, which Lockheed won. Boeing transferred its effort into commercial designs and was first to market in 1969 with its wide-bodied giant, the 747. The DC-10 and the L-1011 followed in 1972.

These were a new generation of jets. They were far longer and wider than previous airliners, and required development of very large engines. These new engines achieved greater thrust from a fan that pushed large quantities of air through ducts surrounding the combustion chamber, adding to the thrust from the engine's exhaust. These giant airplanes also required new ground support equipment and terminals. Thus, significant investments were required of the aircraft and engine builders as well as of the airlines and airports.

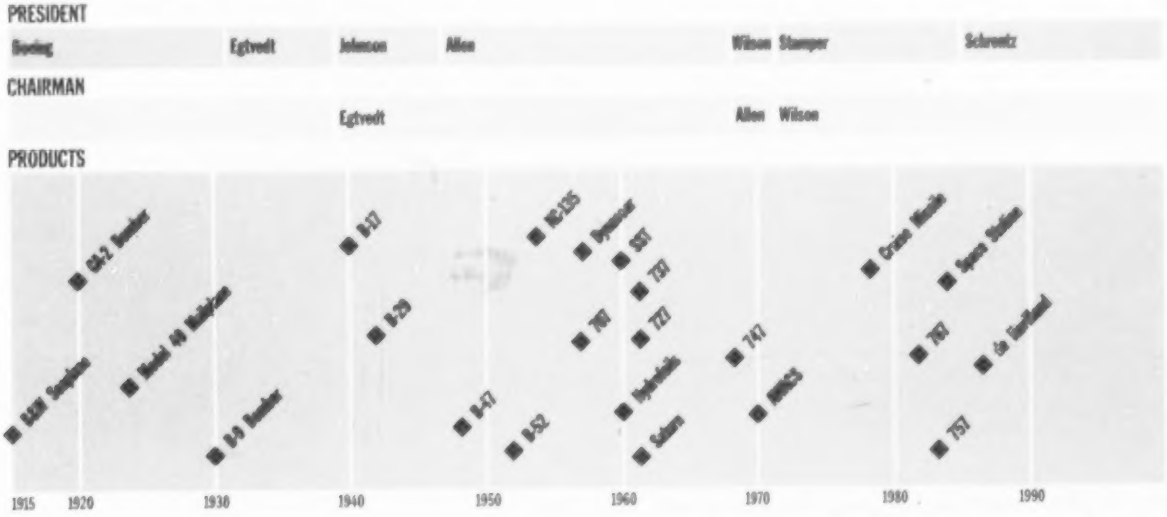
The fortunes of these companies were affected by the costs and risks they incurred. Boeing had a close brush with financial disaster from 1969 to 1971. A credit crunch and national recession led airlines to cancel orders just as the company was experiencing unprecedented costs for simultaneous construction of the first 747s and the factory in Everett needed to build them. Adroit financial maneuvers and draconian layoffs kept the company going. Tex Boullioun, president of the Boeing's commercial airplane subsidiary at the time, has been quoted as saying, "We came within a gnat's whisker of not making it."

McDonnell Douglas and Lockheed found themselves competing head to head with look-alike designs, and neither company was able to make a profit on their models. McDonnell Douglas managed to stay solvent despite engine problems that led to catastrophic DC-10 crashes. Despite a highly regarded design, Lockheed was less successful in marketing its product. Lateness in getting the L-1011 to market was a key factor in its limited success.

Lockheed's delays were due partly to its choice of an engine builder for the L-1011. Rolls-Royce contracted to develop the engines, but failed to complete successful designs on schedule. This pushed the engine-maker into receivership, and came close to bankrupting Lockheed as well. Boeing, meanwhile, had its 747s in service with Pratt & Whitney engines.

Both the British and U.S. governments became involved in extricating Rolls-Royce and Lockheed. The political involvement was unprecedented. The companies were bailed out with government funds in Britain and government loan guarantees in the United States. After surmounting these dif-

Figure 2: Significant Events in Boeing's History



ficulties, Lockheed returned to solvency and paid off its loans but ultimately canceled the L-1011 program, thereby leaving the commercial airliner business. Rolls-Royce recovered also and remains in the jet engine business as a supplier for both U.S. and European aircraft.

Introducing the 757 and 767

Having barely survived the launching of the initial wide-body aircraft in the seventies, Boeing went on to offer two new models in the early eighties. The wide-bodied 767 and the narrow-bodied 757 were introduced in competition with an upstart European aircraft consortium, Airbus Industrie. Boeing's goal was to replace the aging 727 and to offer another medium-sized plane with more energy-efficient engines, advanced avionics, and lighter airframes. The 767 was an entirely new, wide-bodied design, whereas the 757 was based on older fuselage designs but used modern engines. The Airbus A310 competes directly with the 767. It is too early to determine if any of these programs will ultimately be profitable for their builders.

The Military and Space Businesses

Defense contracts are an inextricable part of the airplane business. The military services are major customers for all of the leading U.S. companies, and much new technology has flowed from the defense business into commercial aircraft. Advances in airframes, engines, avionics, and other areas have been crucial to the development of civilian aircraft.

For Boeing, the military services have been important customers since the earliest years of the company; its first significant multiple plane order came from the U.S. Navy. Other important military products developed over the years include the B-17s and B-29s that made Boeing's reputation during WWII, the AWACS airplanes equipped with electronic detection and warning systems, and the cruise missiles (see Figure 2). Prior defense department experience was crucial in quickly developing the 707 that thrust the company into the forefront of post-war commercial aviation. Boeing's military transportation equipment revenues have grown more rapidly in the eighties than any other industry segment, accounting for about 28 percent of Boeing's revenues in recent years (see Table 1).

Table 1: Boeing Revenues by Industry Segment, 1978 to 1985
In thousands $

	TRANSPORTATION EQUIPMENT		MISSILES AND SPACE	OTHER INDUSTRIES
	Commercial	Military		
1978	3,826	811	592	294
1979	6,395	804	667	339
1980	7,665	923	509	431
1981	7,004	1,687	667	525
1982	5,135	2,372	938	682
1983	6,998	2,617	1,047	569
1984	5,457	3,103	1,366	516
1985	8,024	3,973	1,219	529

SOURCE: Boeing Company Annual Reports

The space business is also significant for Boeing. The company participated in several military missile programs and NASA's Saturn program, which boosted American astronauts to the moon. Boeing constructed the lunar rovers used to explore the moon's surface. It has played a role in the space shuttle program, and is bidding on contracts to develop a permanent, manned, space station. Currently, missiles and space systems account for about 9 percent of Boeing's revenues.

Boeing played a major role in the ill-fated SST program funded by the U.S. government. With a goal of producing an American supersonic transport for commercial applications ahead of the British-French consortium and the Russians, the government conducted a first-round design competition, picking Lockheed and Boeing proposals in 1964 for a second-round competition. In 1966 Boeing's effort was chosen in the final competition, and a full-scale development program got underway. The program became controversial as commercial market studies questioned the marketability of the aircraft; scientific evaluations raised serious questions about noise from sonic booms and potential destruction of the ozone layer of the atmosphere by a fleet of SSTs in operation. Annual appropriation battles in the U.S. Congress became increasingly difficult for the program, and it was canceled in 1971.

Other lines of business were developed by Boeing after its reversals in the early seventies. Attempting to diversify its high-technology product line, the company moved into turbine-powered hydrofoil vessels, mass transit vehicles, computer and consulting services, electronics, and other fields. Several of these efforts, including hydrofoil boats and mass transit vehicles, were relatively unsuccessful. Others such as Boeing Computer Services Co. and Boeing Electronics Co. have grown into healthy subsidiaries. Aircraft and missiles/space systems remain the core of Boeing's product lineup, and still dominate its revenues (see Table 1).

Assessment of Current Market Prospects

Boeing is the non-communist world's dominant aircraft producer. It garnered 56 percent of the value of jet airliners ordered between 1980 and 1984, while its major domestic competitor, McDonnell Douglas, secured just 24 percent. McDonnell Douglas does not have as wide a range of aircraft configurations, as wide a customer base worldwide, or as big a start on the next generation of aircraft as Boeing has. The only other competitor for large jet airliners in the non-communist world is Airbus Industrie in Europe, a multigovernment consortium that has a smaller market share to date (16 percent of orders between 1980 and 1984), and only three major airframes against Boeing's extensive lineup. A variety of domestic and foreign manufacturers make up the rest of the market, mostly in smaller jets and turboprops.

Between 1986 and 2000, Boeing forecasts a worldwide commercial airplane market of $278 billion in constant 1986 dollars. Fifty-nine percent of that market growth will occur outside the United States. Replacement or rehabilitation of older aircraft will provide a market of $5.5 billion per year, while orders for airline expansions are expected to run an average of $13 billion per year. Spectacular sales performances in 1985 and 1986 ensure that Boeing will secure a high percentage of this market.

An examination of the history of the industry gives reason for some caution in assessing the company's prospects. The passenger airline business, the market for two-thirds of Boeing's output, has been subject to large cycles in its orders. Airlines order planes when they are making large profits, and they also cancel orders when passenger traffic and profits fall off. Even "firm" orders melted away as airline profitability faded in the early seventies. Deregulation has made the domestic airline industry more competitive and less stable, creating uncertainty about future domestic orders.

Much of the commercial aircraft market is overseas, in practically every non-communist country. Boeing's export sales have ranged from 42 to 62 percent of total sales in the eighties, making Boeing one of the nation's top four exporters. With foreign

(continued on page 14)

Pacific Northwest Personal Income Indicators[1]

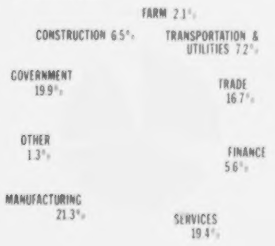
MAJOR VARIABLES, 1985

	WA	OR	ID
Total Personal Income *in millions $*	61,185	33,921	11,173
Population *in thousands*	4,409	2,687	1,005
Personal Income per Capita *in $*	13,876	12,622	11,120
Rank Among States			
Personal Income	19	32	43
Personal Income per Capita	21	30	42

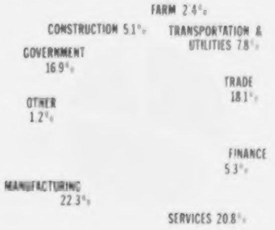
SOURCES OF PERSONAL INCOME

earnings by place of work, 1985

WASHINGTON



OREGON



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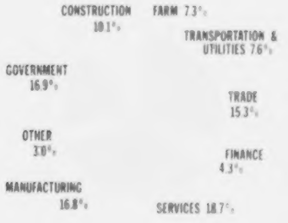


PERSONAL INCOME, 1985 AND FIRST HALF 1986

by major source and earnings by industry in millions $

	WA 1985 Total	WA[2] 1986 Jan-Jun	OR 1985 Total	OR[2] 1986 Jan-Jun	ID 1985 Total	ID[2] 1986 Jan-Jun
TOTAL PERSONAL INCOME BY PLACE OF RESIDENCE	**61,185**	**63,760**	**33,921**	**35,110**	**11,173**	**11,383**
Nonfarm Personal Income	60,286	62,943	33,351	34,639	10,582	10,919
Farm Personal Income	899	817	570	472	591	464
Population in thousands	4,409	NA	2,687	NA	1,005	NA
Per Capita Personal Income in dollars	13,876	NA	12,622	NA	11,120	NA
DERIVATION OF TOTAL PERSONAL INCOME						
Earnings by Place of Work	43,104	45,246	23,951	24,916	8,075	8,172
Less: Personal Contribution for Social Insurance	2,534	2,697	1,627	1,707	549	563
Plus: Adjustment for Residence	746	740	423	435	50	57
Equals: Net Earnings by Place of Residence	41,316	43,290	21,906	22,774	7,576	7,666
Plus: Dividends, Interest, and Rent	10,423	10,646	6,310	6,427	1,902	1,935
Plus: Transfer Payments	9,447	9,824	5,705	5,909	1,696	1,782
COMPONENTS OF EARNINGS BY PLACE OF WORK						
Wages and Salaries	35,175	36,867	18,898	19,596	5,874	5,963
Other Labor Income	3,192	3,379	1,933	2,050	557	565
Proprietors' Income	4,736	5,001	3,120	3,271	1,644	1,644
Farm	595	509	375	274	436	307
Nonfarm	4,141	4,493	2,745	2,997	1,208	1,338
EARNINGS BY INDUSTRY						
Farm	899	817	570	472	591	464
Nonfarm	42,206	44,429	23,381	24,444	7,484	7,709
	33,615	35,492	19,326	20,143	6,120	6,317
AGRICULTURAL SERVICES, FORESTRY, FISHERIES, AND OTHER	**384**	**412**	**211**	**241**	**93**	**101**
Agricultural Services	209	NA	107	NA	74	NA
Forestry, Fisheries, and Other	175	NA	104	NA	19	NA
MINING	**157**	**154**	**83**	**78**	**151**	**125**
CONSTRUCTION	**2,808**	**2,923**	**1,230**	**1,354**	**812**	**844**
MANUFACTURING	**9,195**	**9,805**	**5,350**	**5,406**	**1,356**	**1,329**
Nondurable Goods	2,464	2,572	1,296	1,311	629	626
Food and Kindred Products	707	NA	481	NA	340	NA
Paper and Allied Products	635	NA	356	NA	69	NA
Printing and Publishing	392	NA	249	NA	69	NA
Chemicals and Allied Products	424	NA	62	NA	124	NA
Durable Goods	6,731	7,233	4,054	4,095	726	703
Lumber and Wood Products	1,039	NA	1,777	NA	400	NA
Machinery, except electrical	472	NA	456	NA	157	NA
Primary Metal Industries	478	NA	302	NA	3	NA
Transportation Equipment	3,465	NA	138	NA	9	NA
TRANSPORTATION AND PUBLIC UTILITIES	**3,087**	**3,180**	**1,871**	**1,912**	**614**	**624**
Railroads, Trucking, Water, and Other	1,973	NA	885	NA	334	NA
Communication	847	NA	413	NA	119	NA
Electric, Gas, and Sanitary Services	267	NA	312	NA	117	NA
WHOLESALE TRADE	**2,714**	**2,796**	**1,689**	**1,719**	**420**	**417**
RETAIL TRADE	**4,465**	**4,638**	**2,645**	**2,711**	**813**	**825**
Food Stores	811	NA	460	NA	166	NA
Auto Dealers, Service Stations	760	NA	505	NA	180	NA
Eating and Drinking Places	985	NA	555	NA	148	NA
FINANCE, INSURANCE, AND REAL ESTATE	**2,431**	**2,707**	**1,266**	**1,398**	**351**	**389**
Banking	973	NA	481	NA	158	NA
Other Finance, Insurance, and Real Estate	1,458	NA	785	NA	193	NA
SERVICES	**8,374**	**8,879**	**4,980**	**5,327**	**1,511**	**1,619**
Business Services	1,532	NA	841	NA	375	NA
Health Services	2,633	NA	1,772	NA	423	NA
	8,590	8,938	4,055	4,302	1,363	1,397
FEDERAL AND CIVILIAN	**1,895**	**1,906**	**812**	**828**	**303**	**303**
MILITARY	**1,206**	**1,237**	**97**	**116**	**131**	**136**
STATE AND LOCAL	**5,489**	**5,796**	**3,145**	**3,359**	**929**	**959**

NOTES

1. Bureau of Economic Analysis, U.S. Department of Commerce
2. Seasonally adjusted at annual rates
3. Transfer payments are defined as payments to individuals for which they do not render current services
4. The percent change is calculated on a quarter to quarter basis

PERSONAL TAX AND NONTAX PAYMENTS, 1985
in millions $

	WA	OR	ID
FEDERAL GOVERNMENT (net of refunds)	**5,686**	**2,793**	**766**
Individual Income Tax (net of refunds)	5,522	2,711	725
Individual Income Taxes (Gross)	6,813	3,299	917
Less Refunds	1,290	588	192
Fiduciary Income, Estate and Gift, Nontax	80	30	27
STATE GOVERNMENTS	**686**	**1,752**	**366**
Individual Income Taxes	0	1,352	260
Death and Gift Taxes	20	26	3
Motor Vehicle Taxes	252	39	19
Other Taxes	25	17	10
Nontax Payments	389	317	73
LOCAL GOVERNMENTS	**572**	**289**	**187**
Other Local Taxes	23	23	2
Local Nontax Payments	548	267	185
STATE AND LOCAL PERSONAL PROPERTY TAXES	**54**	**0**	**0**
TOTAL PERSONAL INCOME	**61,185**	**33,921**	**11,173**
Less: Total Personal Tax and Nontax Payments	6,998	4,834	1,318
Equals: Disposable Personal Income	54,187	29,088	9,855
PER CAPITA DISPOSABLE PERSONAL INCOME	**12,289**	**10,824**	**9,808**

TRANSFER PAYMENTS, 1985[3]
in millions $

	WA	OR	ID
GOVERNMENT PAYMENTS TO INDIVIDUALS	**8,897**	**5,387**	**1,572**
Old Age, Survivors and Disability Insurance	3,348	2,296	1,011
Medical Insurance Payments	1,621	1,046	286
UNEMPLOYMENT INSURANCE BENEFITS	**490**	**290**	**89**
INCOME MAINTENANCE BENEFIT PAYMENTS	**715**	**371**	**94**
Aid to Families With Dependent Children	342	110	20
Food Stamps	142	142	35
VETERANS BENEFIT PAYMENTS	**340**	**213**	**66**
BUSINESS PAYMENTS TO INDIVIDUALS	**280**	**177**	**77**
TOTAL TRANSFER PAYMENTS	**9,447**	**5,705**	**1,696**

An Explanation of Personal Income

State personal income accounts constitute the most important source of information about the income conditions of a state's residents. Used in conjunction with other statistics such as population, employment, and price changes, personal income data not only form the basis for determining people's well-being on a geographic basis, but are useful in making economic forecasts, assessing market opportunities, and determining the allocation of payments for governmental programs. Personal income data are an indispensable tool for analyzing regional economic change.

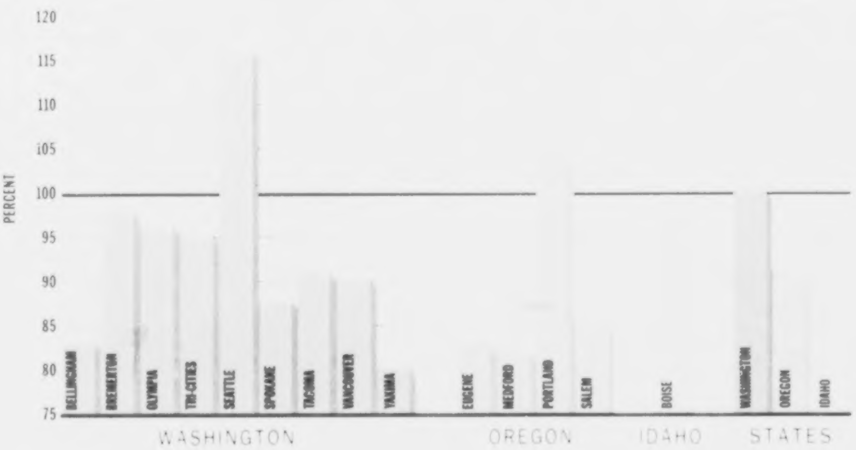
A state's personal income is defined as the income received by, or on behalf of, its *residents*, excluding those who are temporarily working abroad. It consists of income received by individuals from all sources: wages and salaries of employees, net income of proprietors, dividends, net interest, rent, and transfer payments. Personal income is a description of the income people receive, as distinct from Gross National Product, which measures the value of goods and services produced.

The Bureau of Economic Analysis (BEA), a section of the U.S. Department of Commerce, estimates personal income based on data supplied by the employment security departments of each state and other governmental agencies. The BEA reports national personal income estimates monthly, while it publishes estimates for states quarterly with a lag of about five months. These estimates are refined as more complete data become available. The BEA makes county estimates on an annual basis, with publication lagging more than a year. Although the quality of data varies, the methods of estimation assure consistency across states and with national aggregates. The BEA publishes its findings, along with a number of other statistics and analyses of the U.S. economy, in the monthly *Survey of Current Business*. Historical data for the states, along with a complete description of sources and methods for assembling personal income, is contained in the BEA's report *State Personal Income 1929–82*, which is available in many libraries and may be purchased from the U.S. Government Printing Office.

PERCENT CHANGES IN[4] PERSONAL INCOME

YEAR	QTR	WA	OR	ID
1981	1	2.0	1.8	2.6
	2	1.9	0.4	0.7
	3	2.7	1.9	2.0
	4	−0.1	−0.9	−2.3
1982	1	0.9	−0.1	−0.3
	2	1.1	0.4	1.8
	3	0.4	0.6	1.0
	4	1.7	1.3	3.6
1983	1	0.5	1.5	−0.3
	2	2.4	2.4	3.5
	3	0.7	1.1	0.8
	4	4.8	3.4	6.3
1984	1	−0.5	1.5	−2.0
	2	1.1	1.3	1.1
	3	1.9	1.8	1.8
	4	1.3	1.5	3.4
1985	1	1.6	1.3	1.2
	2	1.3	1.3	0.6
	3	0.8	0.7	−0.1
	4	2.1	1.8	3.2
1986	1	1.2	0.8	−1.0
	2	1.4	1.3	0.9

PERSONAL INCOME PER CAPITA IN SELECTED METROPOLITAN AREAS AND STATES
as percent of national average, 1983



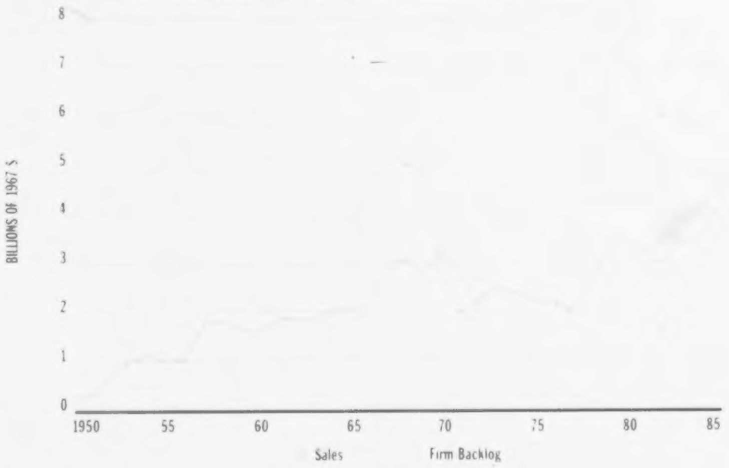
(continued from page 11)

customers, however, come a host of political and social uncertainties.

Boeing's total sales and firm backlog have fluctuated greatly over the decades (see Figure 3). The current period of robust sales was preceded by two other booms, one from 1950 to 1959 and the other from 1965 to 1969. In both of these periods, sales were made so rapidly that a backlog of orders started to build to more than twice the level of annual sales. Actual production lagged behind both of these indicators, but it, too, has been cyclic, with huge layoffs in the lean years (see Figure 4). The end of the current boom is not yet apparent; Boeing enjoyed a second record sales year in 1986 and the firm backlog is again building to twice current sales.

Figure 3: Boeing Sales and Firm Backlog

deflated by Producer Price Index, industrial commodities (1967=100)



However, there is no reason to think that the boom will last indefinitely. The next recession, whenever it comes, will probably bring a sharp drop in Boeing's commercial airline sales. Fortunately, the backlog amassed in the current ordering binge will sustain Boeing for several years, as long as the airlines do not cancel or defer delivery dates.

Military orders may already have peaked in the current cycle, and competition is very intense for new military programs. The space business has entered a new period of uncertainty as the government responds to the Challenger shuttle explosion and struggles to reduce the overall government deficit. Thus, new government business is as uncertain as ever.

Major Risks

The aircraft business is driven toward concentration by the economies of scale in aircraft design and assembly. Boeing gambled with its early post-war commercial designs, but emerged victorious with a much bigger bet on the 707. In the lean years that followed the initial wave of orders for the 707, Boeing managed to develop the 727, its all-time best seller. A subsequent bet on the 747 severely strained the company again, although the 747 eventually became very successful. Recent orders for its revamped 737, for the various configurations of the 747, and for newer models have helped propel Boeing to unprecedented domination of the commercial market. Lockheed has pulled out altogether and McDonnell Douglas currently has only two significant offerings. Airbus has entered the fray, with three air frames in production and more in development.

Despite a thinning on the supply side of the market, competition between the three remaining large commercial airframe builders is intense. The same pressures that motivated Boeing in the past are pointing it towards the next set of crucial bets on future generations of aircraft. Smaller designs powered by a new generation of engines again require significant investment. Partners in Italy and Japan have been brought in to share the risk, providing firms in those countries access to technologies they might never have developed on their own. This internationalization of production helps insure access to important foreign markets as well as spread the development risks. However, it aids and abets foreign aspirations to develop aircraft independently in the long run. Japanese firms are widely thought to have a long-run goal of entering the aircraft industry on their own.

Among the issues Boeing must consider is the rate at which to invest in new technologies. New engine designs using rear-mounted propellers to increase airflow around the exterior of a jet engine are now in advanced stages of development. Such a "propfan" or "unducted fan" engine was recently flight-tested on a 727 airframe. Research continues on advanced materials to make stronger, lighter airframes, on computer technologies, and on advanced avionics and cockpit displays.

In addition to technological issues, the company must decide what size aircraft to build, with customers differing in what they see as most desirable. One likely model is a 150-seat airframe to replace the aging fleet of 727s. The 7J7 powered by a propfan engine is Boeing's preliminary design effort on such an airplane. Its exact size, range, and other features are not yet finalized.

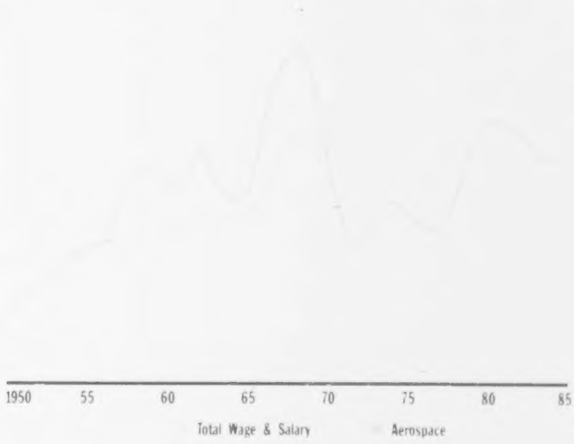
Developing new aircraft is very expensive, especially without any recent military designs available for modification. As a consequence, Boeing must invest a large percentage of its net worth in a new aircraft, as it did with the 747, or spread the risk partly onto partners, as it did with the 757, the 767, and the 7J7 propfan airplane now in development.

Aircraft and automobile manufacturers are the most visible part of a trend toward internationalization of production. The consequences are both profound and unpredictable. Are U.S. aircraft manufacturers helping foreign corporations gain an upper hand, giving away our technological edge to protect short-term profits? Will the world economy become more efficient with benefits to all in the long term? Would technology transfer occur anyway as ideas and people flow across international boundaries? There are no easy answers, but the courses chosen by Boeing and other industrial firms are reshaping the world economy.

Impacts on the Regional Economy

Boeing is not only large in relation to its competitors worldwide, it is the dominant private sector employer in the state of Washington. The Seattle area has prospered in Boeing's growth spurts and suffered depression-like conditions in Boeing's declines. In Washington, the aerospace industry is largely made up of Boeing and its

Figure 4: Aerospace and Total Wage and Salary Employment
in King and Snohomish counties



local suppliers. Figure 4 shows how large aerospace employment is relative to other industries in the Puget Sound counties of King and Snohomish. At nearly 80,000 jobs currently, aerospace is still the dominant basic industry in the region but, as other sectors—especially services—have grown in the last fifteen years, the aerospace share has diminished.

In the massive Boeing layoff starting in 1969, the company's local workforce fell from 103,000 in 1968 to 40,000 in 1972. The impacts on the Seattle area were devastating. People left the region, leaving behind unsold homes and closed businesses. Total wage and salary employment in King and Snohomish Counties fell from 553,300 to 489,000. An infamous billboard appeared, asking the last person in Seattle to turn out the lights.

In the years that followed, Boeing slowly recovered as the commercial airplane market revived, but its total employment in Puget Sound has still not risen above 80 percent of its 1968 peak. Meanwhile, total employment in King and Snohomish Counties has climbed to over 800,000, driven by international trade, a variety of high-tech successes, and expanding service sectors.

Our dependence on Boeing has also lessened because the company has directed some of it expansion elsewhere. Its space operations are naturally located in the Southeast, near other space-related facilities. Military work is done at several locations including Wichita and a plant in Louisiana. The electronics subsidiary recently opened a new facility in Dallas. This regional diversification may make for more stability in Seattle, but we may lose both downside risk and upside potential for growth. However, the correlation between Boeing employment and total employment has not disappeared. A slowing of the total employment growth rate in 1974 and 1975 is associated with another wave of layoffs at Boeing, and a decline in total employment from 1980 to 1982 is associated with a third set of layoffs at Boeing.

Wider Economic Development Impacts

Boeing employs thousands of engineers. Thus, it is not surprising to find a large college of engineering at the University of Washington, including an aeronautics and astronautics department. These programs provide a large supply of trained engineers, a major benefit to other technically advanced firms. The success of Washington's current economic development efforts is influenced by the health of these programs.

A good deal of local subcontracting is done by Boeing. Figures from Boeing indicate annual purchases from Washington suppliers ranging from $500 million to $900 million during the eighties, providing a substantial stimulus to the state economy.

A somewhat surprising aspect of Boeing's presence in our region is the relative infrequency of new, high-tech, startup firms led by former Boeing personnel. The Silicon Valley is famous for this. Two or three bright people with an idea leave one firm and start a new one, grow rapidly, and in turn become the source of new spinoffs. Thus, Fairchild begat National Semiconductor, Intel, Teledyne, Raytheon, and others. National Semiconductor in turn begat Zilog, and a number of firms have spun off from Intel.

Puget Sound can point to some notable spinoffs from Boeing. For example, four former Boeing employees started Rockor in 1962. Other ex-Boeing employees have formed firms to supply Boeing with parts. Some of the company's employees who were laid off during the seventies started up small businesses, sometimes in quite unrelated fields. Boeing Computer Services Co. and the Boeing Electronics Co. are in a sense internal spinoffs. They are separate companies wholly owned by The Boeing Company, but they offer their products to the outside world as well as to other Boeing companies.

Despite these examples, The Boeing Company does not seem to be the cauldron of budding entrepreneurialism the way Fairchild was for the Silicon Valley. We are not aware of anything approaching the number of examples of employees leaving to start leading edge firms in new fields or in competition with their former employer as has occurred in the Silicon Valley.

This difference has many possible causes. It may be due to the loyalty Boeing engenders in its employees through pay, benefits, and corporate culture, or it may be due to the nature of the technologies developed at Boeing. A new chip or computer design could be exploited from a garage using personal savings to fund startup costs in the early days of Silicon Valley, and even now entry costs are relatively low. For would-be missile and airplane builders, the entry costs are prohibitive; even established giants in the industry cannot afford new product development at times.

Part of the explanation may lie in the lack of competition within the local labor market for many of the key skills used at Boeing. Southern California has many firms in the aircraft and aerospace businesses, while the Puget Sound area has one very large company and several small aerospace firms. A would-be entrepreneur leaving McDonnell Douglas to start a business can do so knowing that should the startup business fail, there might be a job opening at Hughes or Lockheed on which to fall back. In Washington, the would-be entrepreneur has fewer fall-back options should the startup venture fail. Thus, it is perhaps not surprising that Boeing in Seattle seems to have been less of a stimulus to new business than Fairchild in Silicon Valley. ılı

The Restructuring of the American Economy

by Lawrence R. Klein

The deindustrialization of America, the economy in transition, and the loss of American competitiveness have become commonplace phrases. We are in fact going through a comprehensive restructuring. I would like to present some impressions about major aspects of the restructuring and where it might lead us.

Technical progress is always taking place; we can expect to see new products and processes, and the joint presence of growth with maturing and dying industries. I can remember horse-drawn delivery and service wagons, competing daily newspapers in many American cities, crowded railway passenger terminals, and little used sheds for air terminals. I do not find it hard to accept the passage into oblivion of many economic activities and the emergence of new ones. That should be an accepted aspect of economic life.

I can also remember when Japanese slide rules were vastly inferior to German and American slip sticks, and the days when Brazil, South Korea, and Taiwan were backward producers of primary products. At the present time in the United States, we find ourselves in fierce competition with countries that were formerly dominated by us economically. Countries have risen and fallen economically just as industries or sectors of the economy have come to the fore and have also lapsed into the unknown.

Goods versus Services

The most frequently cited aspect of American restructuring is that we are quickly expanding in service-producing activities at the expense of goods-producing activities. The demise of manufacturing activity has people concerned. Foreign competition and product substitution appear to be driving forces in this restructuring.

Employment opportunities in manufacturing, as measured by its share of all employment, appear to be declining steeply (see Figure 1). Manufacturing employment has fallen from more than one-third of all jobs in 1950 to little more than 15 percent projected for the end of the century. However, manufacturing's share of total U.S. output shows no tendency to decline. It has fluctuated about a steady level of approximately 20 percent for more than thirty years, and is not expected to change very much in the next decade. The relation between output and employment provides an indication of remarkable productivity improvement.

The situation is entirely different in services (see Figure 2), where the employment share has been on a rising trend for a long time and is expected to continue along this path in the foreseeable future. The output share has also been growing and is expected to continue to do so, but at a considerably gentler gradient. In terms of employment, a 10 percent sector should eventually become a 25 percent sector, but for output, the growth is from roughly 10 percent to less than 15 percent.

The medical services component, which includes hospital care, nursing care, and doctors' services, has been on a strong upward trend, with some fluctuations. This pattern should continue. The shares of non-medical services have also been on an upward trend, but with wider fluctuation. Much less growth is expected from the present time forward.

Finance is a separate service-producing sector. This sector is being rapidly transformed by deregulation. It shows a half-century gain of more than 5 percentage points for output against a gain of little more than 2 percentage points for employment. Here, too, there should be rapid technical progress, related in no small way to the gains in productivity in communications and to some extent in transport.

It is commonly said that we are quickly becoming a nation of fast-food servers. This is not the case. Many of the strong service-producing sectors are in highly technical lines of activity—medicine, information, and finance, for example. The manufacturing share of output has not been declining over a long time period, and should not decline in the near future. The agricultural output share may have stabilized at a low level.

Employment opportunities have, however, changed. There will continue to be an exodus from agriculture. What we may see, and quite justifiably as a mark of society's progress, is a shortening of the work week in manufacturing by one to three hours. Also, labor force growth has slowed down; unemployment is not likely to rise, in a trend sense, as it did during the seventies. We should get a demographic bonus as far as unemployment is concerned.

A structural change that may have something to do with the growth of the service-producing sector, but is not necessarily related, is the changing composition of the paid labor force to include more women. There are some forecasts of a slowing in the

Figure 1: U.S. Manufacturing Employment and Output
as a percent of totals

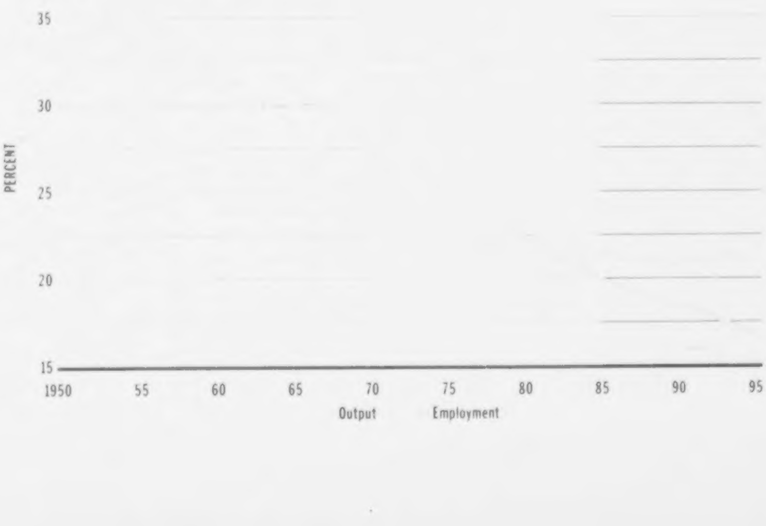
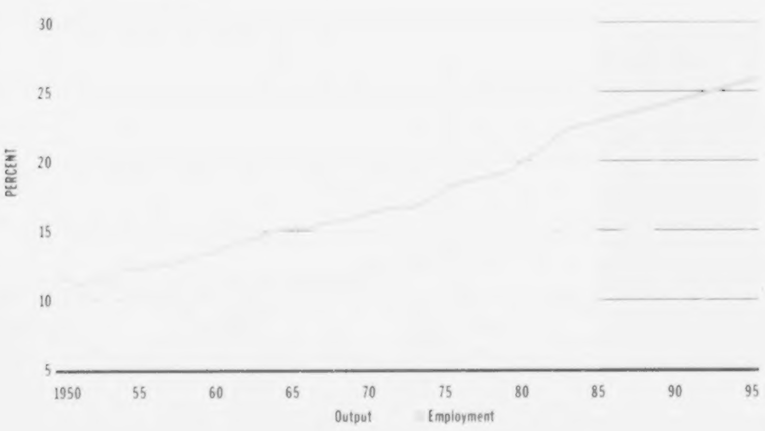


Figure 2: U.S. Services Employment and Output
as a percent of totals



rise of female participation rates, which is one aspect of the overall tendency for the labor force to grow more slowly in the decade ahead.

The Two Deficits

There is another possible structural change that must be considered, namely the size of the two deficits of the United States, the internal deficit and the external deficit (see Figure 3). The situation since 1981 shows a large inflow or source of funds from abroad, associated with the external or current account deficit, that broadly matches the large funding requirements of domestic government (federal, state, and local consolidated). These two deficits represent a structural change because the normal historical value of these two balances is near zero.

Has the structure of the economy changed in such a way that we can live indefinitely with two large balances just offsetting one another, or should they both be brought back as quickly as possible to their equilibrium levels? A second, related question is whether an adjustment process can take place on a steady, gradual path to a "soft landing," or will there be a free-fall of the dollar followed by a "crash landing" involving an interest rate run-up, domestic recession, and then world recession? The Wharton forecast emphasizes the "soft landing," but its success is by no means assured. If both deficits were judiciously reduced, success probabilities would be enhanced.

The international adjustment process is underway through the policy of depreciating the dollar, or letting natural economic forces bring it down. The "soft landing" scenario assumes that a fall in the exchange value of the dollar will restrain imports and stimulate exports such that the external deficit falls toward zero. This will, of course, take a few years because it has been allowed to deteriorate to such large proportions.

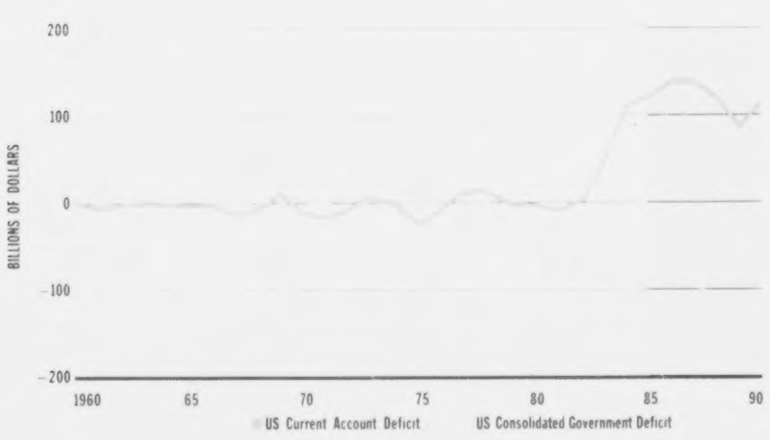
Some people argue that we will not be able to reverse the structural change in our trade account for several reasons. Many people feel that we have permanently lost our ability to compete effectively with other nations in textiles, apparel, electronics, motor vehicles, and other manufacturing activities. We are still preeminent in computers, aircraft, and some new high-technology areas, but our advantage is presumed to be fading due to poor productivity gains, high wage rates, and non-competitive profit margins. As foreign capital flows in, we find that servicing our international debt requires large external interest payments. Also, many foreign companies earn profits from their American branches. Although we are one of the world's most efficient producers of agricultural commodities, politically motivated embargoes, large overseas crops, some foreign protectionism, and new competition from Brazil, Argentina, and Australia have worked toward elimination of our net export surplus in agricultural commodities.

I accept all of these facts and arguments, yet I do believe that our trade position will improve. There is a faint indication that the worst point of our imbalance has been reached, and that the dollar's drop will gradually show its effect, both for goods and services. We may not get back to full balance (equilibrium at zero) soon, but we might be able to do so after five years or so.

It will be necessary to bring down both deficits. If Congress and the White House could get closer together on closing the budget gap, we would need less of the world's pool of financial capital. This would lessen the danger of a "crash landing," the scenario we must by all means avoid. The present adjustment process is helping to get us back towards equilibrium if allowed to run its full course.

Laurence Klein is Benjamin Franklin Professor of Economics at the University of Pennsylvania. This article is condensed from his remarks made at the third Seafirst Economic Forum, held on October 15, 1986 at the University of Washington.

Figure 3: U.S. Current Account and the Consolidated Government Deficits
as a percent of totals



III

HIGHER EDUCATION NEEDS TOP PRIORITY

by Richard S. Page

Higher education will be at the top of the 1987 legislative agenda. It's high time. Our community colleges, regional universities, and major universities are in trouble, and their role is vital to the future of our state.

Last June Governor Booth Gardner declared, "There is no better investment in our state's economic future than an investment in higher education." He urged a new statewide commitment to excellence in higher education.

The Washington Roundtable agrees. Our "Report and Recommendations: Higher Education in Washington," published last July, is a strong and urgent statement supporting the indispensable contribution of higher education to our state's future. It emphasizes the need for improvements in quality and calls for targeting our concern and any new dollars on the most important priorities. Our report explains that normal growth in state revenues would generate approximately $110 million in additional funding for higher education, provided its share of the general fund stayed at least as large as in the current biennium.

Since the publication of our report, however, we have received mostly criticism and complaints. Some say the report is too generous to higher education and that the state must first pay attention to improving public schools and social and health services. They point to unmet human needs, crowded classrooms and state institutions, and overworked teachers and case workers. They argue that the homeless, the mentally ill, the very young and the very old, and the impoverished and vulnerable persons in our state need greater assistance and deserve government's help before we increase funding for colleges and universities. This is a moving and eloquent argument. It is especially cogent given the actual decrease in the state's share of its general fund to public schools in recent years and the steady increase of dependent people whose very survival is at stake.

Others, led by the principal spokesmen for their institutions, argue that higher education must have far more money than we recommend. William Gerberding, president of the University of Washington, says he is "bitterly disappointed" by the report and that our numbers do not add up. John Terrey, executive director of the State Board for Community College Education, faults us for lack of vision and insufficient funding. Even the new official Higher Education Coordinating Board has weighed in by adopting the highest cost of three options for raising faculty salaries, overruling its staff recommendation that was one-third less expensive.

What these advocates seek is much higher funding for higher education, whether it comes at the expense of public schools or social and health services or whether it takes tax increases. The chairman of the Higher Education Coordinating Board, Charles Collins, flatly recommends a tax increase to pay for higher faculty salaries. This is an attractive argument too, since faculty salaries lag from 15 to 20 percent behind similar college and universities in other states, and since instructional support and maintenance budgets have also eroded.

The Roundtable argues for targeting available funds and making sure higher education at least maintains its current share (15.5 percent) of the general fund budget. Some critics favor K-12 education and social service spending. Higher education advocates plead for vast new sums of money and the tax increases necessary to provide them. How does one make sense of these competing views? One must first have an understanding of the state general fund discipline and, second, a commitment to systemic change, not business as usual.

The state's general fund budget totals $9.2 billion in the current biennium. Community colleges get 5 percent, or almost $500 million, and our six colleges and universities get 10 percent, of which nearly half ($400 million) goes to the University of Washington alone. Higher education indirectly competes with the three other major parts of the general fund: public schools, human resources, and general government. Competition for general fund dollars, which the legislature allocates in the budget each biennium, is fierce. In the next biennium (1987–89), the general fund is estimated to grow at current tax rates by $800 million to a total of $10 billion. That would represent an 8 percent increase, approximating the inflation increase over two years. Each 1 percent of a $10 billion general fund equals $100 million in revenue.

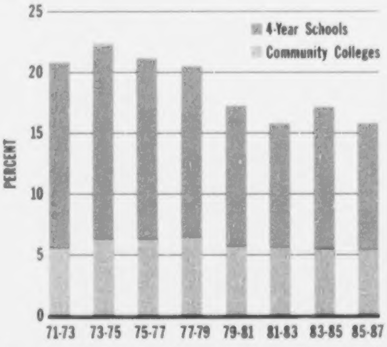
Higher education's share of the general fund has been declining steadily for twelve years (see figure). The University of Washington's share was about 7 percent in 1973–75, but has dropped to 3.7 percent in 1985–87. Between 1983–85 and 1985–87, the general fund increased almost 14 percent, but higher education's share increased only 7 percent. In addition, there have been winners and losers in higher education over the past decade. Higher education has suffered because funding for the other programs is decided first; higher education gets what is left over.

The discipline of the state general fund is simply this: (1) higher education must compete with other important programs and (2) its general fund share has been declining. Higher education will be fortunate just to maintain its current share in the next biennium. Any increase in dollars over and above the normal growth in the fund for each share would have to come at the expense of those other programs or from a tax increase that would enlarge the general fund beyond its normal growth.

The Roundtable is advocating a change in state policy to help higher education. The decline in higher education's share must stop; its current share of 15.5 percent should at least be maintained. The legislature should make this policy decision early in the budget process, not leave higher education to be last in line.

This method would generate approximately $110 million for higher education. These funds should be allocated to the

Washington State Higher Education
appropriations as a percentage of general fund



Source: Legislative Evaluation and Accountability Program Office, Nov. 1985 highest priority needs, especially faculty salaries and instructional support. We recommend that no more than a third of the total increment ($30 to $35 million) be allocated across the board to help pay for inflation and current services carried forward. This would permit some $55 million to go to raising faculty salaries and restoring instructional support budgets. The remainder should go to increase student financial aid, expand the program to reduce adult illiteracy, and other high priorities (see table of recommendations and allocations). That would be a big down payment toward bringing faculty salaries up to the average of their peers over the next two biennia. It would send a clear signal to our faculty of the value we place on them and to the higher education community around the country that Washington intends to strengthen the quality of its higher education system.

Why not a tax increase? Why not fully pay for inflation and restore faculty salaries to the peers' average in one biennia instead of two? Washington taxpayers are already paying about the same proportion of their personal income for higher education as the rest of the country. Our study demonstrates the need for more discipline in higher education, more attention to evaluation of programs, and more focus on priorities. Why should the state throw more money at a system that has no goals or mission statements, no performance or outcome measures, no agreement on the size or scope or purpose of community college education, no serious evidence of eliminating wasteful or unnecessary programs, and no real understanding of the high rate of student transfers?

The Roundtable is not flatly opposed to a tax increase for higher education and will study proposals offered by the governor and others for that purpose. We will review the spending and revenue estimates carefully for the coming biennium to make sure there are sufficient funds to at least maintain higher education's share of the budget and fund real improvements in faculty salaries and support budgets.

WASHINGTON ROUNDTABLE RECOMMENDATIONS

	Priority Recommendations for the 1987-89 biennium	**Cost Estimates in millions**
1.	Develop goals and role and mission statements for the higher education system and the public colleges and universities	**$0**
2.	Target future budget increases to priority needs.	**$0**
3.	Target improvements in faculty salaries and support budgets.	**$55**
4.	Increase student financial aid and review programs.	**$10**
5.	Increase minority enrollment.	**$1**
6.	Combat adult illiteracy and basic skills deficiencies.	**$4**
	Additional Recommendations	**$0**
7.	Implement rigorous program review by institutions and systemwide.	**$0**
8.	Create minimum admission standards for all four-year institutions.	**$0**
9.	Improve and standardize the central data collection system across all institutions.	**$0**
10.	Adopt guidelines for off-campus programs.	**$0**
11.	Support and refine the peer methodology for comparisons of the higher education system.	**$0**
12.	Increase Western Washington University's budget allocation for faculty.	**$4**
13.	Improve educational quality for undergraduates and expand the evening program at the University of Washington.	**$3**
14.	Sharpen the focus for Washington State University.	**$0**
15.	Oppose creation of a new public four-year school; favor pilot comprehensive upper division programs at community college sites.	**$0**
16.	Study costs and benefits of student transfers.	**$0**
17.	Create two centers to support research and applications of new technologies in undergraduate teaching.	**$2**
	Subtotal	**$79**
	Higher Education Coordinating Board funding for multiple recommendations	**$1**
	Partial inflation off-set (across-the-board)	**$30**
	TOTAL	**$110**

We remain convinced, however, that higher education can do a far better job than it has so far in putting its own house in order, in insisting on quality, and in focusing on priorities. Doing these things will take courage and wisdom. It will require college presidents and deans to admit that they must prioritize and not continue teaching all the courses they now teach. It will require changing the way we do business. What is needed is systemic change, not business as usual. At present our "system" of higher education is hardly a system. It is more a collection of entrepreneurial colleges and universities: twenty-seven community colleges, four state colleges, and two large universities all developing programs to attract students and funding. We have no agreed-upon definition of roles and missions, and no one institution knows what it can do best. We also have a continuing, unresolved tension between quality and access, with the emphasis on access because we are trying to educate far more students than the national average. Yet we have not been willing to cut back on enrollment or spend larger amounts of money to ensure quality for larger enrollments. Nor have we been willing to step up to the hard decisions of dropping marginal courses or controlling cost increases.

There are no easy answers in a public policy issue as complex and as important to the state as this one, which deserves the attention and the debate it is getting. The Roundtable is committed to working with others to strengthen higher education, the key to our future competitiveness and humaneness.

Richard Page is president of the Washington Roundtable.

WE HAVE A CHOICE TO MAKE

by Charles T. Collins

The Washington Roundtable report on higher education is a quality effort. There is much with which I agree. Nonetheless, I believe the Roundtable's recommendation on faculty salaries is a mistake—a serious mistake.

Although the Higher Education Coordinating (HEC) Board's faculty salary recommendation is approximately three times the Roundtable's initial recommendation and more than twice the Roundtable's current recommendation, "vast new sums of money" are not involved. The difference between the HEC Board and the Roundtable on faculty salaries is less than 1 percent of the state's current budget.

All parties to this debate, including the Roundtable, are advocates of something. Not surprisingly, virtually all profess support for an excellent system of higher education. The rub is that educational excellence is pursued among the limitations of scarcity. How good a higher education system does Washington want? Is it prepared to pay for what it wants? There is no morally right or wrong answer to those questions. They are pragmatic and should be viewed fundamentally as investment decisions.

At this point a few facts will help. There are approximately 500 universities in the United States that are similar to our 2 research universities and 4 regional universities. Average faculty compensation at Washington state universities is in the bottom one-third of that group. If you think of the University of Washington as one of the top 20 or 30 schools in the United States, it is important to recognize that average faculty pay at 100 of those schools is higher. Of the 162 research universities in the United States, Washington State University's average pay ranks in the bottom one-fifth.

The Roundtable's recommendations would result in little improvement in the relative ranking of our universities' salary levels. The HEC Board recommendation, however, would move the average pay of our schools from the bottom one-third to the upper one-third of the 500 universities. The result would not produce an elite status for any of our schools. There would still be 40 schools that have average pay higher than the University of Washington. In fact, a full professor at the University of Washington would still earn $11,000 per year less than his or her counterpart at Cal-Berkeley.

The faculty salary issue is essentially a rather normal compensation question. Is it believable that our universities can attract excellent, or at least above average, faculty while paying substantially less than average? In simple business terms, the proposition that we can achieve excellence with faculties paid in the bottom one-third of the competition is implausible.

As with any investment, timing is everything. The big expansions nationally in higher education with the arrival of the baby boom in the late fifties and early sixties has produced an aging faculty that will soon retire. The quality of their replacements will determine the quality of our university system for the next thirty years. If we are going to make the investment in competitive faculty salaries, we should do it now. The real investment mistake would be to wait until faculty turnover is complete and then raise salaries. The consequence of that delay would be paying high salaries to mediocre faculty and the forfeiture of any return on the investment.

The rhetoric to be avoided is the notion that we can have high-quality higher education at our current investment level. Teaching is about teachers. Great teaching is about great ones. Whatever romantic ideas we might have about college professors and their career choices, they turn out to be much like the rest of us. Superior talent merits and seeks higher compensation.

We are at a watershed. The reality before us is the unavoidable conclusion that current compensation levels will result in a university system of below average quality. If you are prepared to accept that quality, then the current investment level is the right one. If you advocate the current investment, the only requirement of responsible debate is that you not represent it as compatible with one of the better quality systems in the country. Again, there is no right or wrong answer—only a choice.

Charles Collins is chairman of the Higher Education Coordinating Board in Washington state.

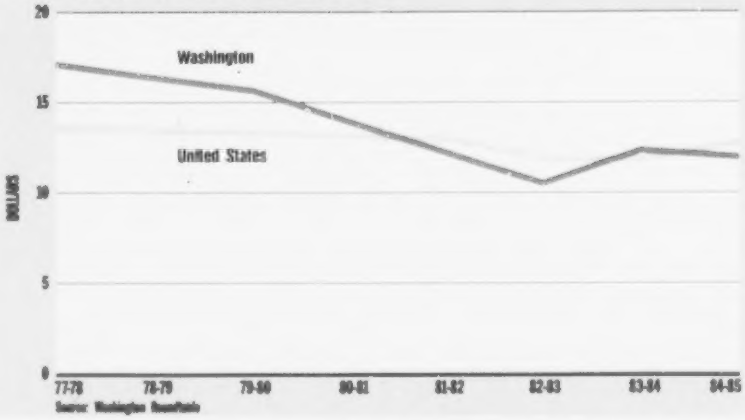
STATE APPROPRIATIONS ISSUES

by Jerry Sullivan and Paul Sommers

The Roundtable's recommendation for careful evaluation of higher education programs is well taken. The University of Washington (UW) administration supports the Roundtable's call for the development of mission statements, and has implemented several reorganizations to increase efficiency in recent years, including the elimination of several departments. However, one flaw in the Roundtable's argument centers on the call for Washington to maintain the U.S. average in general fund appropriations per thousand dollars of personal income. The average is currently about $12.50 appropriated for higher education per thousand dollars of personal income (see Figure 1). If we go back to 1977 and look at the conditions then, we see that Washington was well above the U.S. average.

What was there about 1977 that led our legislature to position higher education appropriations above the average? Our legislature may have recognized that a state without large, private universities to assume some of the costs of education would have to spend more tax dollars than the U.S. average. Many states have the Stanfords, Yales, Dukes, MITs, Cornells, and Harvards, so that relatively modest state spending for public higher education is needed. Washington's private colleges and universities are of high quality but educate proportionately fewer of our students than Harvard, MIT, and other private institutions do in Massachusetts. The national average is 3.4 higher

Figure 1: Appropriations per $1000 Personal Income



Source: Washington Roundtable

education students attending public institutions for each student attending a private institution. In Washington the ratio is 6.7 higher education students for each private school student. Washington must be above the average in higher education appropriations to accomplish in the public sector what many other states accomplish in a private-public mix.

Perhaps the solution to higher education's funding problems is to invite Stanford to move from Palo Alto to Tukwila. In the absence of that unlikely move, however, Washington's higher education appropriations per thousand dollars of personal income should be set at about the 1977 level of $17.50, a raise of $5.00. This raise would add about $300 million to higher education's current appropriation. This amount is in addition to the $110 million increase proposed by the Roundtable to keep higher education at its current level.

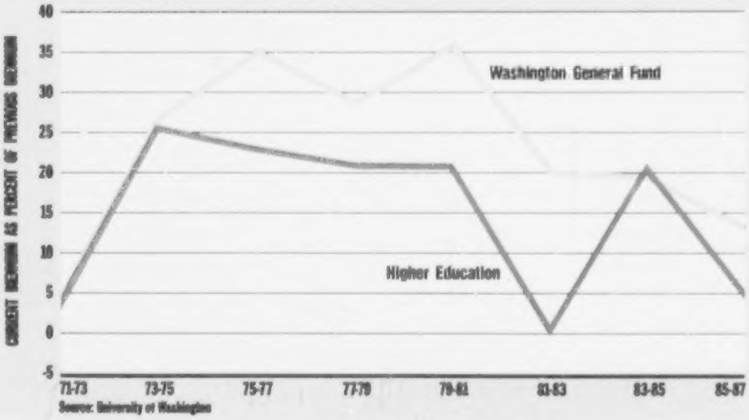
The people of Washington clearly want higher education to play a major role in their economic and cultural lives. They have established major research universities in Seattle and Pullman, other colleges and universities to serve various regions within the state, and a large community college system to train workers for a changing economy. These institutions have been created over many decades because Washingtonians have a better than average commitment to public education. For the Roundtable to call for keeping higher education appropriations at the U.S. average per thousand dollars of personal income is to imply that an historical commitment is no longer operating and that a new way of looking at education has emerged in Washington.

That commitment has not changed. In fact, higher education has simply been compelled to subsidize the maintenance of other crucial state programs during a period of economic turmoil. In the last few years, the state has moved to fund K-12 education and to assume the full burden of pension liabilities. There has been less legal and constitutional reason to support higher education, and consequently full funding has not been available. Let's take a look at the growth in appropriations over the past eight biennia (see Figure 2). Up until 1975, the historic commitment we previously mentioned was in effect. Then a decline set in and higher education funding grew at the same rate as the general fund in only the 1983–1985 biennium.

Washington is not merely an average state, as the Roundtable report implies. It is, and in the long run will be, better than average in its commitment to public higher education. After all, that is good business. Many states are recognizing the importance of investing in higher education and are hurrying to catch up to and surpass the level of excellence that Washington has achieved. The payoff for such investment is high. For example, among all U.S. colleges and universities, the University of Washington joins MIT, Stanford, Howard, and Johns Hopkins as one of the top five recipients of federal research grants and contracts. In 1986 it received $237 million from private and federal sources. That's $64 million more than it received in state tax support and tuition and fees combined for its operating budget. To continue to generate that kind of cash flow into the state, the state must invest in the UW at a higher level of funding. Just as a business must make investments to stay competitive, so must a university, or its competitive edge will wither, its faculty will depart for more congenial surroundings, and its grant and contract income will dwindle. The UW needs to make up a $76 million annual gap between its operating budget and the average budget of the institutions with which it competes.

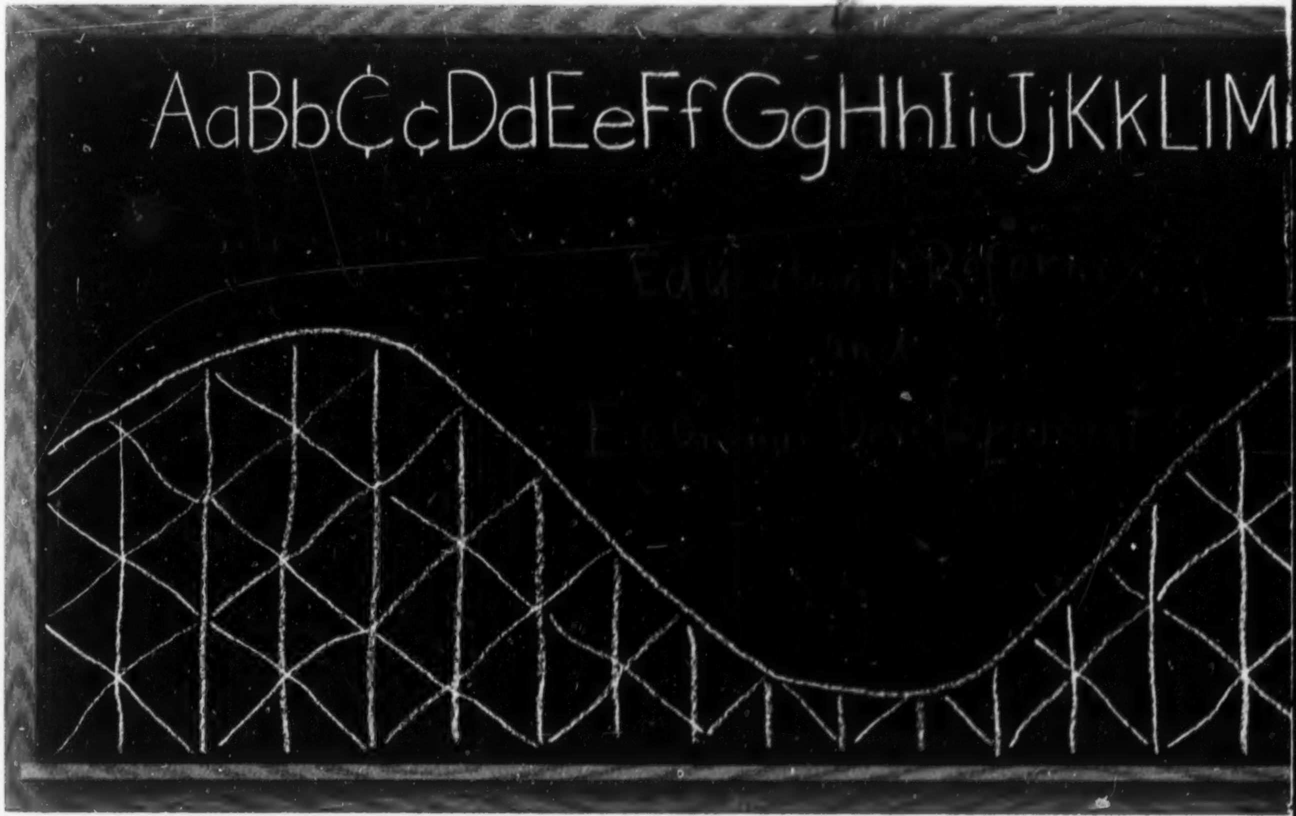
In sum, Washingtonians have shown an historical commitment to higher education. That commitment needs to be reasserted, not just because it is part of the vision the people have of themselves, but also because it is simply good sense to invest in our future.

Figure 2: Growth in Appropriations



Source: University of Washington

Jerry Sullivan is management editor of Pacific Northwest Executive *and associate professor of business communications at the University of Washington. Paul Sommers is an economist and director of research for* Pacific Northwest Executive.



by Susan M. Quattrociocchi

Every decade American education seems to ride a roller coaster of rhetoric and reform. A commission report or book first sounds the alarm. The press then hypes the problems "discovered" in education and a spate of educational reforms mandated by state or federal legislators follows. A period of quiet then prevails during which education sinks out of view, seemingly little changed.

A Nation at Risk, the report published by the National Commission on Excellence in Education in 1983, arrived on schedule a decade after *Crisis in the Classroom* by Charles E. Silberman. This 1973 book described schools as "grim, joyless places . . . oppressive and petty . . . intellectually sterile and aesthetically barren, preoccupied above all with power and control, docility and conformity." In the early sixties, A. S. Neill stunned the nation with his book, *Summerhill*. More than two hundred thousand copies were sold each year in the sixties and seventies. Readers were told that much of the learning side of schools was unimportant; children needed the three R's and "tools and clay, sports, theater, art, and freedom." The fifties generated two educational reports: *The Pursuit of Excellence*, published by the Rockefeller Foundation, and *The American High School Today*, published by the Carnegie Corporation. Both were influential in promoting the new, large, comprehensive high schools that offered a variety of curricula choices, separate ability groupings, and tracking for academic versus vocational students.

Read as a history of school reform, these and other reports illustrate that each era seeks to redefine the purposes of education to meet what it sees as society's most pressing needs. While each decade's reports reveal wide dissatisfaction and impatience with the schools, they also portray a strong belief in the schools' ability to ameliorate society's problems.

Although the organization of schools, the structural arrangements of schooling, and the processes of teaching and learning remain virtually untouched by reform, Americans have seemed to change their minds twice in the past century about the major goals of education. Diane Ravitch points out in *The Troubled Crusade* that Thomas Jefferson's plea for an American educational system that waged "a crusade against ignorance, superstition, poverty, and oppression of body and mind in every form" gave way in the forties to the progressive education movement. Its major goal was "teaching for effective living," rather than the acquisition of knowledge, with teachers striving to produce "compatible citizens, good workers, and good homemakers." In the sixties and seventies the progressive agenda was superseded by the open education movement designed to make students both "happy and equal."

In the eighties the context is different. Americans are alarmed by what they under-

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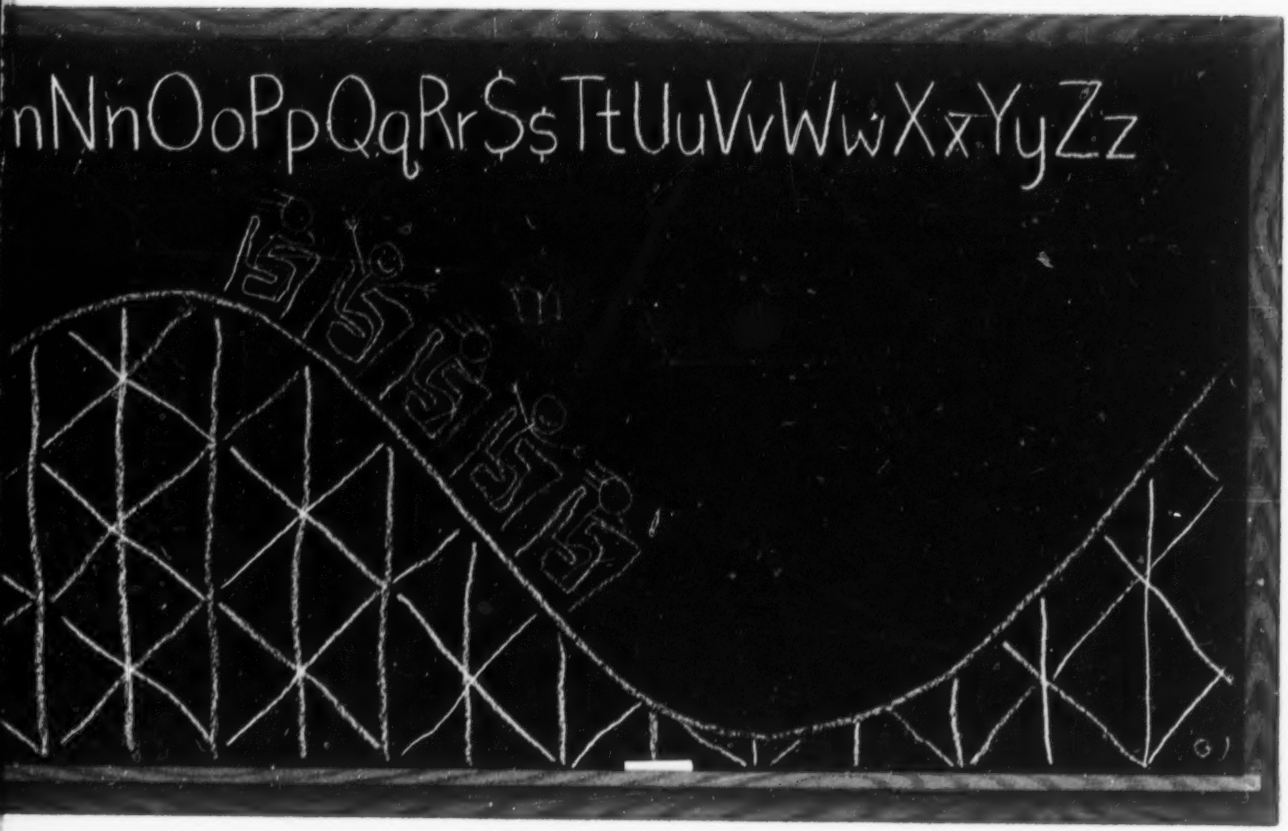


GARY JACOBSEN

stand to be a direct connection between a faltering economy and failing schools. However, the causes of school failure are many. In addition, major social, economic, and cultural trends have diminished the role of education in society. Are we in the process of establishing training for job-related skills as the major goal of education? Let's examine some of the major assumptions and implications of the recent reform movement, particularly as the rhetoric and substance of reform have been tied to economic development.

Is There a Correlation?

An assumption made by almost all reformers is that there is a strong correlation between a failing educational system and a failing economy. In 1983 *A Nation at Risk* cried out: "We are in peril, our economic freedom is in danger because education failed." In a follow-up study, top CEOs stated that one important reason for the nation's growing inability to compete in world markets is the inadequacy of the educational system. According to the prestigious Carnegie Forum on Education and the Economy, the connection between economic strength and the quality of education is strong and growing.

Economists have long debated the issue of education's impact on our industrialized economy, often with very conflicting results, but few would agree with reformers that the economy faltered because of inadequate schools. The 1979–83 recession had multiple causes: soaring world prices for energy resulted in worldwide inflation and recession; new technology increased international competition; deficits and interest rates in the United States were high; and an overvalued American dollar resulted in the loss of overseas sales. The unique status of the United States has been eroding as other countries have been catching up in productivity and in product innovation.

The result of slowed innovation has been devastating for many U.S. industries and workers, particularly in the Northwest. Oregon and Washington's wages fell dramatically during the recession years. In Washington, per capita wage and salary income peaked in 1979 and has declined by over 10 percent since then. Both states have experienced moderate economic recovery, but the bulk of employment growth has been in services and retail trade, where annual compensation averages $10,000 to $13,000 as compared to approximately $22,000 per year for jobs lost in the lumber and wood products industry and in construction. In both Washington and Oregon, legislative reports have concluded that low wages are replacing unemployment as the states' major economic problem.

Reformers seem to believe that millions of good jobs have gone and will go begging due to a lack of skilled applicants when, in fact, the reverse is true. There is an acute shortage of good jobs, 6.8 percent unemployment, and continued underemployment, with millions of Americans working in either part-time jobs (20 percent), or dead-end jobs. Excellence in education can not alter these economic and occupational realities.

Education and Culture

Assuming that educational problems originate solely in the schools, reformers have attempted to isolate the causes and solutions to either the schools or teacher training institutions. Since schools are inextricably bound up with our society, economy, and culture, any attempts to reform schools must consider these factors. Recommendations have focused on school curricula, standards and expectations, time spent in class, improved teaching (including the issues of teacher pay, merit, and training), school organization and management, and leadership issues. Table 1 presents recommendations that have been proposed in the Northwest as well as those enacted by state school boards.

Some reformers view the issues of social and cultural changes as even more serious than those raised in *A Nation At Risk*. Clifton Wharton, Jr., president of the State University of New York, believes that recent cultural upheavals "have resulted in the displacement of the schools as the major transmitter of knowledge and values between generations." He also maintains that the media now have a far greater influence on children than schools since students spend only twenty-five to thirty hours per week in school for three-fourths of the year, compared to hundreds of hours of bombardment by TV, radio, and videos. It is not difficult to guess which holds the students' attention when Miami Vice, Rambo, and MTV compete with art, history, and algebra. Advertisers now design ads with more images, music, sex, and humor to hold the interest of the first media generation. Media specialists note that by the time teens leave high school, they will have viewed half a million commercials consisting of twenty-five seconds of entertainment and a five-second message.

It is exactly that five-second message that educators fear. A world depicted in snippets and a series of unconnected images is a world that defies understanding or in-depth analysis. What is worse according to Niel Postman, author of *Amusing Ourselves to Death*, is that the medium of television has reduced all serious discourse to entertaining banter; "happy talk" passes as information and wit and laughter pass as knowledge.

Postman contrasts Orwell's *1984*, where culture becomes a prison, to Huxley's *Brave New World*, where culture becomes a burlesque. Orwell feared a society that would ban books; Huxley feared a society where there was no reason to ban books, because no one would want to read one. Orwell feared truth being concealed from us; Huxley feared truth being drowned in a sea of silly chatter yielding a trivial culture driven by our almost infinite appetite for distraction. Orwell feared control by inflicting pain; Huxley feared control by inflicting pleasure.

Is it true, as Postman suspects, that we are so busy laughing that we haven't noticed that we have stopped thinking? Isn't it time that we acknowledge that the media are having a profound impact on the role and effectiveness of schools in our society? We might also ask ourselves if there isn't a clash between our taste in entertainment and what we say are our goals for our children's education.

Our "At Risk" Children

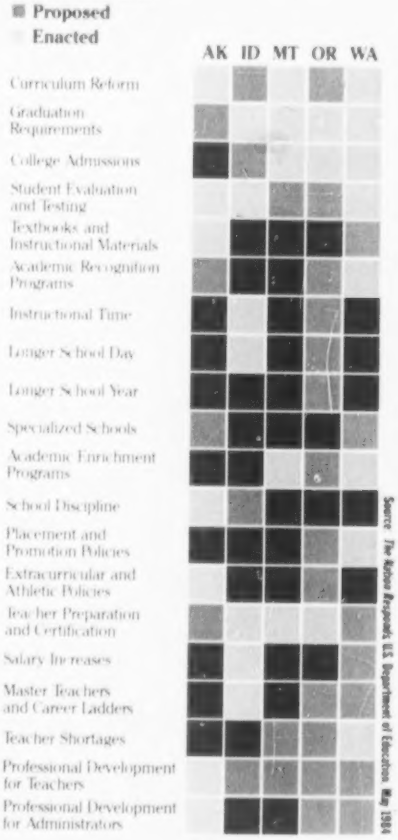
Another factor ignored by reformers is the increasingly precarious situation of our young people. The poverty rate of children up to age seven declined from 25 percent in 1959 to 14 percent in 1969, but rose sharply from 1979 to 1983, and is now between 22 and 25 percent. These fourteen million American children now living in poverty account for 40 percent of America's poor. The number of preschoolers eligible for Head Start, a federal program of demonstrable success, has increased by one-third since 1979 but enrollment has remained constant due to inadequate funding.

In Washington, as throughout the United States, the increase in poor children is due almost entirely to the breakup of families and the low wages of female heads-of-households. By the time they reach sixteen years of age, 40 percent of school children will have parents divorce and 56 percent of those will live with their mothers in poverty. In addition, of today's children, 30 percent use latchkeys, 15 percent do not speak English, and 15 percent have physical or mental handicaps.

Not surprisingly, these children are becoming tomorrow's troubled teens, as measured by increases in the use of alcohol and drugs, teen pregnancies, and attempted suicides. Consider the following statistics:

- 8 percent of teenagers attempt suicide each year,
- more than 50 percent of pregnant teens are unmarried,
- 70 percent of these child-mothers do not finish high school, and
- welfare costs for these young mothers totaled $16.6 billion in 1985.

Recent Initiatives Taken by Northwestern States for Secondary School Reform



Source: *The Nation Responds*, U.S. Department of Education, May 1984

These disturbing facts must be taken into account when discussing the causes of school failure. Had reformers looked outside the schools, they would have found several reasons to explain why student scores have declined since 1960 while per pupil spending doubled in the same period. They might also have been less inclined to blame the schools for failure and more likely to propose solutions that dealt with students' needs. Without help for families, single heads of household, poor children, and disturbed adolescents, it is unlikely that proposed school reform will result in educational excellence.

Status Quo?

Another assumption of school reformers is that educational improvements will result from adding more course requirements, setting minimum competency levels, and increasing the emphasis on testing. Reformers seem to take schools as they exist for granted. They shouldn't. Although the structure of the economy, the labor force, and the process of work have all changed dramatically in the last fifty years, the structure of education has not changed.

America's education has been organized around a production or an industrial model for the past fifty years, with educational planning and curricula design centralized at district or state levels. Teaching is delivered in small, measurable doses and, like factory workers, students have little influence over their own learning. This "mass education" method has never worked well for the majority of our students and will work even less well in an age of increasingly divergent students.

Unfortunately, few studies call for a restructuring of education or for a new understanding of the teaching/learning process. Even fewer suggest a more complete understanding of knowledge and intelligence, currently overlooked by our emphasis on testing. Increased testing also disregards the fact that students might have learned the material to be tested, if given the amount of time needed to learn. We continue to place as many as thirty children from a wide variety of backgrounds and with widely varied abilities in one classroom where we expect all of them to learn at the same speed and in the same manner.

Most reform-oriented reports focus on skill development and mastering minimum competencies. The danger is that focusing on skills, process, and obtaining minimum competencies that can supposedly translate into job-ready skills will result in short-lived and narrow curricula development. Some educators are concerned that a content-free, skills, present-oriented approach will define education only in terms of its relation to current job needs. What about the true purposes of education—the development of intellect, an understanding of the past, an exposure to ideas, an appreciation of the arts, and scientific and technical understanding? Educator-philosopher Page Smith reminds us, "Education is not a process of transmitting often obsolete information; it is a matter of transmitting inspiration, not of instruction but of awakening and, ultimately, of transforming. Education is not a body of facts, but a habit of mind."

The point of discussing some of the underlying assumptions of the educational reports is not to denigrate the value of those reports, which have focused needed attention on problems facing schools. My point is that these assumptions have had direct and often negative implications for reforms already enacted and that they strongly color future reforms. The first stage of reforms that focused on secondary school requirements, testing, competency levels, student discipline, and increased academic performance is drawing to a close. William Chance, who directed Washington's Temporary Committee on Educational Policy, Structures, and Management during its two-year existence in 1983 and 1984, says the reforms are seen as "both significant and superficial." He also notes that the reforms are often attributed to the involvement of the business sector.

Some reformers argue that reforms must necessarily be "top down" since systemic change requires the involvement of state government. But the history of school reform provides proof that the opposite is true. Each time the political process redresses school problems, another layer of conformity and control is added. Ravitch warns that "top down" reforms pass through the experiences, intentions, and purposes of each school board member, principal, administrator, and teacher. Attempts to introduce national or state reforms, therefore, tend to to filter down to the lowest common denominator: district competition for better test scores.

Perhaps the unusual focus on educational failure has obscured some of the issues with which businesspersons, citizens, and politicians ought to be wrestling. These issues include a sputtering economy, a low level of industrial R&D spending, an unfair trade policy that favors importers and penalizes American exporters, and a two-tier occupational structure that discourages many students from staying in school. Other concerns are an anti-intellectual culture that mocks any serious attempt at educational reform, and an ethos that demands excellence in athletics, art, and consumer goods, but seems to fear excellence in intellectual development.

What Business Can Do

What can business do to help develop schools that foster both economic and cultural development? First, businesses can get angry about cuts in social spending that harm schools, families, and children. They can use their considerable influence to support increased aid to dependent families and a state childcare tax credit for working parents. Regional businesses could also support a lower school age, an expanded Head Start program, or provision of school-based pre-kindergarten. A New York City business group is pushing for such reforms, even though the cost would be $2,700 per child; the cost of not providing earlier education can be as much as $10,000 to $50,000 for twelve years of "special education."

The Pacific Northwest region also needs increased assistance for single heads of families, including daycare, counseling and emotional support systems, adequate job training, and access to family-wage jobs. Business groups, educators, and parents need to become much more involved with state and regional economic policies, especially those that can foster the creation of jobs that will support families. Solving the problems in schools may call for more than just raising teacher salaries; it may also call for solutions that supplement the incomes of our poorest families.

Second, business groups can do a great deal to shape the cultural and school environments that foster the love of learning. They can provide symbolic leadership to raise the status of learning through active media campaigns, and can develop methods that increase students' incentives for staying in school and recognize and reward school effectiveness. Several such programs already exist. We need more of them.

The Join-A-School concept matches corporations with schools. New York City has fifty-six such programs that involve paying teachers' overtime salaries for after-school supervision of club and tutoring activities, sponsoring and equipping photography clubs, purchasing library books, and underwriting teacher training. Several corporations in Boston have visited inner city high schools and guaranteed jobs to students who graduate with good attendance and good grades. Some are committing college funds to graduates, and guaranteeing placement after college.

None of this is to say that schools can not effect some real reforms on their own. They can and should, beginning with the creation of a school culture that supports the development of the intellect as the goal of education. Future teachers and administrators should be hired on the basis of their love of learning and their ability to communicate that passion to others. Yet, without community support, the schools will change little. Until we decide what we want from our schools and until we make the needed personal and social commitment to education, we will continue to get the schools we deserve.

Susan Quattrociocchi is an educator and public speaker who lives in Seattle.

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Vol. 3, No. 2 April 1987

The Canadian Connection

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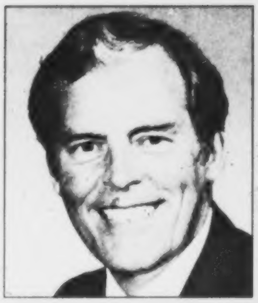
From British Columbia



As good friends, neighbours, and trading partners, it's important for Canada and the United States to keep our long-standing and mutually profitable relationship in mind when problems arise between our two nations. We share the longest undefended border in the world and our two peoples cross it virtually unhindered to vacation, do business, and just plain visit. That flow and interchange of people is matched by one of the most valuable trading relationships in the world—trade statistics show we are each other's best customers.

While from time to time tensions will inevitably emerge, the softwood lumber dispute being an obvious example, it's important that we try to take a long-range outlook. The fact that the softwood issue was resolved through negotiation is important because of the ongoing talks designed to lead to a comprehensive trade agreement between our two countries. Although there is no certainty that an agreement will be finalized, had we failed to settle the softwood irritant, the opportunity to build on our existing commercial ties would certainly have been diminished.

As Premier of British Columbia, I want to see the valuable north-south linkage that exists between my Province and the states of the Pacific Northwest strengthened so that the West Coast economy on both sides of the border can expand and grow. We will differ from time to time but we've shown in the past, as we did when we worked together during Expo to develop tourism, that cooperation can pay dividends.

So when problems do arise, let's strive to remember that more things bind us together than separate us, and that good neighbours always manage to work things out. If we do, I'm convinced we can look forward to solidifying and strengthening our ties of friendship and trade in the years ahead.

Bill Vander Zalm

William N. Vander Zalm
Premier
British Columbia

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Canada-United States Free Trade:

A Canadian View of the Consequences for the Pacific Northwest

by John M. Munro

The possibility of free trade between Canada and the United States is an important topic in Canada now. We Canadians receive a steady barrage of news, opinion, speculation, and analysis of the state of our trading relations with the United States and, especially, the progress of the current free trade negotiations. A survey of the business press in the United States over the last two years shows no equivalent coverage. In fact, it is probable that some U.S. business leaders do not even know that our two governments are in the process of negotiating a free trade deal.

The removal of trade barriers between Canada and the United States has historically been a contentious issue. Both Presidents Nixon and Reagan have mistaken Japan as the United States' largest trading partner, reinforcing Canadian suspicions that the role of Canada in the trade relations of the United States is not appreciated. With the eighth largest economy in the world, Canada is a major world trader. Per capita exports from Canada were about $3,500 in 1985; equivalent figures for the United States were about $1,000 and for Japan about $1,500. Canada's trade is dominated by the United States; over 78 percent of its two-way trade is with the United States, but only about 21 percent of U.S. trade is with Canada. Canadian per capita exports to the United States in 1985 were $2,700, but U.S. per capita exports to Canada were only $210. Thus, the United States is more important to Canada's trade than vice versa. However, a rising trade deficit, coupled with the increasing significance of external trade in the economy, has spurred U.S. interest in freer trade with Canada.

Americans might wonder why it has taken so long to talk about freeing trade. Canada's caution has two sources. The first is the effects on our other trading relationships and the possibility that bilateral free trade would further weaken our participation in the multilateral world trading system. The second source of caution is the possible loss of political independence and cultural identity. Americans tend to underestimate the influence of this nationalist imperative in Canadian lif[illegible]

Another underestimated imperative is Canadian preoccupation with maintaining national unity across a diverse and far-flung set of provinces. National unity requires effective support from provincial governments for any national trade arrangements. Although state governments in the United States are not powerless, their influence on external trade pacts is not as great as that of the provincial governments on Canadian trade policy.

National Barriers and Regional Benefits

Although current Canada-U.S. trade in manufactured products is inhibited by tariff and non-tariff barriers, trade barriers are low or non-existent against trade in resource commodities. Free trade exists in defense products, the automotive sector, and most forest products. The recent advent of high U.S. tariffs on Canadian exports of shakes and shingles and a "managed" trade regime for Canadian lumber exports to the United States represents a shift in trade policy.

Trade in services is the most protected, usually by non-tariff barriers that in many sectors amount to a prohibition on trade. Regulation in both countries restrict the export of services in the finance and transportation sectors, for example. The United States would like the loosening of barriers to trade in services to be a major focus of the next General Agreement on Tariffs and Trade (GATT) negotiations, as well as part of the current bilateral negotiations.

General tariff reductions are scheduled in the next few years as a result of the Tokyo Round of GATT trade negotiations. In 1987 over 80 percent of Canadian exports to the United States may enter free of tariffs. For U.S. exports to Canada, the figure may be 65 percent. These estimates mask the continued presence of non-tariff barriers (preferences, quotas, voluntary export restraints, and subsidies) and the trade that would occur if there were no trade barriers at all. They also ignore the systems of special tariffs and subsidies that each country has installed to protect disadvantaged industries.

Over 78 percent of Canada's two-way trade is with the United States, but only about 21 percent of U.S. trade is with Canada.

Freer trade should result in increased exports and imports on both sides of the border. This increased trade should, in turn, lead to lower prices, thereby increasing real income levels. Recent research suggests that benefits of a 9 percent increase in GNP for Canada as a whole could be attained. Gains to the United States from bilateral free trade with Canada have received less study, but their scale would be much smaller.

Regional advantages are more complex. All regions benefit from the lower prices that come with more open trade. For some regions, freer trade will permit increased specialization of production, allowing each economy to use its resource base more efficiently in producing for regional and export markets and to "fill in" gaps in its resource endowment by importing. An example might be British Columbia producing more electricity for export to the U.S. West Coast. Freer trade will also encourage more utilization of scale economies as production levels increase in firms and industries because of sales to new export markets. Washington manufacturers should be able to increase sales to B.C. markets by replacing Eastern Canadian suppliers and thereby secure lower average production costs.

The benefits from a freer trade regime will not necessarily be shared equally between the two partners.

The importance of these influences will depend on the nature of the regional economy and, in particular, the dependence of its present pattern of industrial specialization on existing trade barriers. Regional economies that have had a concentration of industries producing for the protected domestic market can expect to undergo significant restructuring if those trade barriers are removed. The result will be a more efficient economy and a higher level of output. Regional economies whose industries have not been protected by trade barriers will not undergo much restructuring and will thus escape the trauma of that process. Neither will they receive the efficiency benefits that follow restructuring. Therefore, some regions would experience much structural change in the shift to a free trade environment and others would experience less.

A recent commission on the Canadian economy reached the following conclusion concerning the regional effects of free trade with the United States:

> . . . the regional divisions on the free-trade issue that have been prominent in the past should not occur in the same way today. While some regions may anticipate adverse effects from free trade, we believe that the likelihood is that all regions will benefit, and that Canadians everywhere will be able to enjoy a higher standard of living.

This does not mean that all Canadians or all Canadian firms and industries should expect to benefit. However, it is theoretically possible for the gainers to compensate the losers so that each would be at least as well off as under the current trade barriers. Similar statements could be made with respect to the effects of free trade on the regions of the United States. Of course, the benefits from a freer trade regime will not necessarily be shared equally between the two partners. Ensuring as close a balance of benefits as possible is one of the objectives that trade negotiators are compelled to address.

Another factor in the regional impact of Canada-U.S. free trade is the competition of B.C. wood products in U.S. markets with wood products from the Pacific Northwest. U.S. producers have argued that Canadian lumber exports are subsidized through low government royalty ("stumpage") charges in Canada, and the United States was successful in persuading Canada to levy an export tax on lumber. Would this remedy be possible if there were free trade between our two countries? While the answer would depend on the terms of the agreement, it seems unlikely that there would be an outright prohibition on subsidies or on negotiated remedies to offset their apparent effects. Also, there could be better institutions and procedures available than now exist to address trade problems.

Trade Flows

In 1985, 78 percent of Canada's exports were to the United States; the same percentage for British Columbia's exports was only 42 percent. British Columbia exports more to non-U.S. markets than any other province. Almost two-thirds of British Columbia's $4.8 billion exports to the United States were accounted for by just six resource-intensive commodities: softwood lumber (30 percent of the total), newsprint, natural gas, wood pulp, petroleum and coal products, and electricity. Only 9 percent of British Columbia's exports to the United States were in the manufactured products category.

Canadian exports to the Pacific Northwest (defined as Alaska, Oregon, and Washington in Canadian trade statistics) were $4.0 billion in 1985. Of that total, 45 percent was petroleum and natural gas. About 43 percent of Canadian exports to the Pacific Northwest came from British Columbia.

U.S. exports to British Columbia in 1985 were $2.7 billion. Major U.S. exports to British Columbia included motor vehicles ($410 million), industrial machinery ($280 million), fruits and vegetables ($180 million), and aircraft ($175 million). Generally, northbound trade flows were more diverse in terms of commodities, with no small group of products dominant, than southbound trade. Also, manufactured products made up a higher proportion of the total.

These statistics suggest that neither British Columbia nor the U.S. Pacific Northwest should expect to sell a lot more to the other country under free trade. It is also unlikely that significant new markets in the United States would open up for B.C. industries. For Washington and Oregon, the opportunity to sell products in Canada without trade barriers will be somewhat better, but British Columbia, with an economy approximately the size of Oregon's, is not a large market.

Current Negotiations

The current free trade negotiations began with the presentation of a formal Canadian initiative in September 1985. Since the agreement of Prime Minister Mulroney and President Reagan to reduce impediments to trade in March 1985, it was known that the Canadian request would be granted by the U.S. government. The negotiators were appointed over the 1985–86 winter after an extended period of planning, consultation, and review.

The Canadian media has pointed out that the relative ages and experience of the two chief negotiators and the sizes of their respective teams are a mark of the greater importance attached to these negotiations in Canada than in the United States. The Canadian, Simon Reisman, is twenty-five years older than the American, Peter Murphy, and at a hundred members, the Canadian team is over three times as large. As noted earlier, differences in trade levels and patterns in the two countries provide the basic explanation for this.

There had been several negotiating sessions by January 1987, but very little was reported about the content of the discussions and nothing concerning any outcomes. Both chief negotiators issued routine statements that everything was going very well. About all that is really known is that the U.S. side was anxious to have Canada's social programs (such as unemployment insurance) on the table in the negotiations. From the U.S. perspective, Canadian social programs provide industry-specific advantages greater than those flowing from similar social programs in the United States. Viewed in this way, these programs look like industrial subsidies and unfair competitive behavior. This issue is of crucial political importance because few Canadians want the negotiations to lead to anything beyond a free trade agreement; negotiations on social programs conjure up a more extensive economic union.

The negotiations are guided by industry-specific concerns involving costs, employment, prices, and production. Negotiators strive to balance a complex system of industrial and regional effects to maximize the national benefits of the agreement and to make it as attractive as possible to those whose approval will be needed. This balancing will be more precise on the Canadian side because a much larger portion of our economy is affected, and because regional pressure groups are more alert and powerful. Special quarterly conferences between the Prime Minister and the ten provincial Premiers as well as monthly meetings of senior federal and provincial officials concerning the free trade negotiations have been planned; no similar activity has yet been planned in the United States.

The negotiations are guided by industry-specific concerns involving costs, employment, prices, and production.

Free trade with the United States has broad public support in Canada; 61 percent of respondents in a national public opinion poll in January 1986 were in favor. However, that percentage had declined from earlier surveys and has continued to decline since then, although free trade still enjoys a majority among those with decided views. In the United States, surveys have found more support for limiting imports from Mexico or Japan than from Canada.

Free trade is also supported by the governments of the Atlantic and Western provinces (British Columbia has been a strong proponent), by all the broadly based industrial associations (led by the Canadian Manufacturers' Association), and by some associations with a narrower membership such as the Canadian Electrical Association (which believes it would benefit from free trade with the United States). Opposition has come from other more narrowly based industrial associations (the Canadian Council of Furniture Manufacturers, for example) and from the Canadian Labor Congress (CLC). "Free trade will mean making all our policies—political, economic, social, and cultural—conform to those of the United States," according to the CLC President. The governments of Ontario and Quebec have not declared a firm position; so far their attitudes are somewhere between caution and suspicion.

Objections to free trade in the United States tend to come from industries that have been injured by imports in the difficult trade environment of the last several years. However, the degree of commitment to firm positions concerning the negotiations is much lower in the United States.

Once the negotiators reach agreement on a trade package, the difficult task of governmental ratification will begin. In the United States, Senate approval was secured, with major difficulty, for a "fast track" process for consideration of this agreement; the Senate will vote to accept or reject the agreement but will not be able to amend it. Once Senate ratification is secured, the Administration will be able to proceed to implement the terms of the agreement. Canadian approval will require agreement of the provinces; exactly how many will have to agree is not clear, but it is difficult to envision a feasible free trade arrangement without support from Ontario and Quebec. Then Parliament will have to give its approval. Since the present government has a large majority in the House of Commons, this should not present insurmountable difficulties. The certainty of a U.S. presidential election in November 1988 and the likelihood of a Canadian election about the same time imposes a fairly firm deadline of January 1988 for completion of negotiations.

Shaping a Free Trade Agreement

A comprehensive free trade agreement between Canada and the United States might include the following provisions: (1) elimination of all tariffs over a certain period; (2) reduction in non-tariff barriers affecting trade in goods *and* services; (3) introduction of new institutions and procedures for resolving trade disputes; (4) establishment of mechanisms to coordinate exchange rate changes in U.S. and Canadian dollars to minimize effects on trade flows; and (5) provision of an extended transition period in which to phase in the agreement. Such an agreement would not lead to major economic restructuring in the Pacific Northwest on either side of the 49th parallel because both region's economies are more oriented to offshore trade than to markets in each other's countries. Replacement of some higher-cost domestic products with lower-cost imported products would be of direct benefit to both regions. Also, in an integrated national economy, benefits experienced by one region are passed on to other regions through a variety of interregional adjustment mechanisms. Many Canadian studies have shown that stimulus to the Ontario economy percolates in a substantial way across all regions. The location of major benefit from free trade in the United States is more difficult to pinpoint, but a similar process would occur.

There is ample reason to be pessimistic about the present negotiations resulting in a comprehensive free trade agreement. First, the United States is less interested in concluding an agreement than is Canada. Compromise and accommodation on the U.S. side will therefore be difficult to obtain. Second, Canadians are not united in the strength of desire for an agreement. Earlier attempts, their failure, and the political price paid by the proponents are well remembered. If compromise and accommodation from the United States is unattainable, the negotiations will fail to achieve their main objective.

But they may not fail entirely. There are several partial moves to freer Canada-U.S. trade that could result and that would be beneficial. One change could be new sectoral free trade arrangements, designed to be more flexible than the Automotive Free Trade Agreement of 1965. Another could be the establishment of new institutional arrangements to deal with trade problems between the two countries. The replacement of the current national institutions by an international body modeled on the International Joint Commission, which recommends solutions to boundary problems for consideration by the two governments, would be a step forward both in terms of freer trade and better Canada-U.S. relations. A third beneficial development could be the elimination of one of the major non-tariff barriers between Canada and the United States—the practice of national (or regional) preference in government procurement. Any of these would be worth the cost of the negotiations, and all should be of some benefit to the economies of the Pacific Northwest. ılı

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REGION WATCH

Economic Developments in the Pacific Northwest

National economic growth slowed to a meager 1.3 percent real rate in the fourth quarter of 1986 according to the revised report from the U.S. Department of Commerce. The slow growth rate was due in large part to inventory reduction. However, inflation-adjusted disposable personal income declined throughout the last half of 1986, suggesting that consumer spending will not play the supportive role in 1987 that it did early in 1986. During the fourth quarter of 1986 real consumer expenditures declined, and the savings rate declined to a meager 2.5 percent, the lowest rate in forty years. The prospects for continued real GNP growth now appear even more dependent upon improvements in net exports.

Sensing that a slow economy means near-term interest rate weakness, investors drove security market prices to new highs in January (see the Pacific Northwest Executive Stock Index, p. 16). The optimism in the security markets reflects four additional factors: (1) weakness in the economy leads to an expectation that the Federal Reserve will continue to maintain an accommodative monetary policy, (2) domestic wage and price pressures are barely visible, (3) there has been some improvement in international competitiveness as a consequence of the weakening dollar, and (4) investors seem to be discounting the inflationary potential of monetary expansion, ongoing oil price increases, and the rising costs of imports.

The outlook for regional employment and income growth is generally favorable, but at a pace somewhat slower than last year. The unevenness of the growth patterns remains a concern, with metropolitan areas doing well and resource-based communities lagging. Generally low agricultural prices, continued restructuring in forest products and aluminum, and recent setbacks in mining are particularly troublesome factors for many of these communities.

Oregon plants

Oregon's economic development interests have announced two successes recently. Albertsons plans to build a $50 million, 350 employee distribution facility in Gresham to serve grocery stores in the Pacific Northwest. Nippon Kokan K.K. intends to build a $60 million, 100 employee crystalline silicon manufacturing plant at a site in Millersburg (north of Albany).

According to newspaper accounts, Washington's B&O tax and higher shipping costs were factors that favored an Oregon site for Albertsons despite that state's income tax and higher property taxes. Important factors for Nippon Kokan were a $1 million investment by the state of Oregon in water service facilities, and special, low electric power rates offered by Pacific Power and Light. In addition, a Washington state official indicates that Oregon's incentive package offered more near-term tax relief than Washington's. The Washington site was a winner in present value terms, but the early year cash flow advantage for the Oregon site was preferred by Nippon Kokan.

BPA rates

Bonneville Power Administration has formally opened proceedings that will result in higher power costs throughout the region. In its proposal for new rates to take effect in October 1987, BPA is requesting an 11.5 percent increase for preference customers (PUDs and municipal utilities), a 15.4 percent increase for investor-owned utilities under the power exchange rates, a 0.9 percent increase for industrial firm power customers, and a 0.7 percent decrease for non-firm power customers. In addition, BPA wants authority to adjust rates up or down depending on its success in marketing secondary power.

We can expect to hear extensive debate on the rate case through mid-summer when BPA intends to reach a final decision. Public power interests have already challenged the large increases proposed for them, saying that such large increases would be harmful to local economies and that BPA should learn to live within its means. In a recent public letter, BPA Administrator James Jura claims that the agency has already made extensive cutbacks, and has frozen hiring. Jura states that the increases are due to unavoidable, fixed costs and lower than normal secondary power revenues.

BPA's budget may also be affected by Congress, which is again struggling with massive deficits. Selling the BPA and/or altering the terms of the debt it owes to the federal treasury are items on the table again this year. The recent appointment of Washington's Senator Dan Evans as the ranking minority member of the Senate Energy and Natural Resources Committee, which oversees BPA and the Bureau of Reclamation, may be helpful to the region's efforts to maintain the status quo for BPA.

Foreign investors

Economic development efforts often involve seeking foreign markets for locally produced goods and services and encouraging foreign investors to come into our region to build plants. While investments from, and exports to, the rest of the United States are just as efficacious in improving the regional economy, the judgment of many public officials and business people is that the best hunting grounds are abroad, particularly in Japan.

Foreign ownership is growing in Oregon and Washington, but not in Idaho. Among foreign-owned firms in Washington, employment grew most rapidly during 1984 at firms owned by Canadians and Japanese; smaller increments of growth came from European-owned enterprises. In Oregon, European firms accounted for most of the growth among foreign-owned firms, with the best showing from enterprises owned by West Germans. However, compared to the United States as a whole, the Pacific

Northwest has considerably less foreign ownership as a percent of total employment.

These patterns suggest that investors in Europe and Canada should not be ignored as sources of employment growth in the region. However, there are indications that substantial investments may also be forthcoming from Japan. Peter Drucker, a renowned management theorist, claims that Japan is rapidly moving manufacturing capacity offshore in response to western protectionism and rising costs at home. Drucker claims that Japan's offshore movement is more rapid than was that of the United States in the post-WWII years.

If Drucker is right, an historic opportunity is developing to attract Japanese manufacturing to our shores. The stronger yen gives added incentive to Japanese firms already thinking in strategic terms about establishing a significant manufacturing presence in the United States. Washington and Oregon offer a competitive advantage to Japanese firms by being significantly closer to the "home office" and by providing excellent transportation systems to feed Japanese-made components into manufacturing plants in the United States. Some Japanese firms may also be interested in coming to our region to produce goods for export back to their own domestic markets.

Economic development efforts are often in the news, and attempts to improve the regional business climate are prominently featured in these efforts. Last April we published an article on the business climate in the Pacific Northwest. We criticized the well-known Grant Thornton (formerly Alexander Grant & Co.) business climate survey for having low correlations with actual manufacturing growth rates, ignoring industry-specific factors, and overlooking the benefits of government programs.

A recent business climate study entitled "Indicators of Economic Capacity," conducted by SRI for Ameritrust Co., takes a new and interesting approach. The Ameritrust/SRI study notes three trends in the world economy: rapid technological change, increased internationalization, and growth due to the efforts of small businesses and entrepreneurs. The study argues that regions will benefit from these trends if new technology is readily accessible, the workforce is highly skilled and adaptable, and capital is available to all types of businesses.

Indicators of these characteristics of regional economies show the Northeast as the most favorable region in the country, and the Pacific Coast as the next most favorable. Washington scores well on indicators of the accessibility of technology and the skill and adaptability of the workforce, but poorly on measures of capital availability. Oregon shines in the area of skill and adaptability of the workforce, and does better than Washington on capital availability indicators, but worse on accessibility of technology. Idaho does not do well in this system of indicators. If the Ameritrust/SRI hypotheses about economic trends and economic capabilities are correct, the Oregon and Washington economies should do well compared to the rest of the nation in coming years, while Idaho may grow less rapidly.

In our January issue, we reported autumn profit-sharing and other bonus distributions by the Weyerhaeuser Company. Unfortunately, we got the numbers wrong. The correct figures are $560 thousand to Oregon millworkers and $355 thousand to Washington millworkers; total bonuses (including those to administrative staff and logging crews) equal $1.42 million.

Worth Reading

WPPSS: Who Is to Blame for the WPPSS Disaster

by James Leigland and Robert Lamb, Ballinger Publishing Co., 1986, 255 pp., $29.95.

The Washington Public Power Supply System (WPPSS) set out to build five nuclear power plants in the early seventies. One (WNP 2) has been completed. Two have been mothballed (WNP 1 and 3) and may never be completed. Two more have been cancelled (WNP 4 and 5), and the utility participants' agreements with WPPSS have been declared null and void by the state supreme court, resulting in the country's largest municipal bond default. A flood of lawsuits ensued, amid charges of deceit, fraud, and corruption. These events comprise one of the most significant and most confusing aspects of the Pacific Northwest economy.

WPPSS Management. The authors identify a number of issues of organizational structure and philosophy that contributed to this financial disaster. WPPSS management, for example, emphasized centralized control rather than delegation of authority accompanied by appropriate oversight. This management philosophy worked fine for small hydroelectric utilities, but failed miserably when used to manage an extremely large and complicated nuclear construction program.

Tangled webs of knowledge, responsibility, obligation, and self-interest make any attempt to understand the financing of the WPPSS plants a difficult, perhaps impossible, undertaking. Leigland and Lamb focus on several aspects: (1) the widespread confusion about the role of Bonneville Power Administration in the WNP 4 and 5 financing arrangements; (2) the investment in conservation and fuel-switching by ratepayers instead of accepting the rate increases necessary to meet the utilities' debt service obligations; and (3) the failure of revolutionary approaches to demand projection to gain credibility until far too late.

With many players in a system of concentric rings of overlapping influence, each could avoid some of the responsibility for the WPPSS disaster as the default occurred. In the authors' words, "The struggle to avoid responsibility for WPPSS and its problems has been rather like the frenzied attempts of children to avoid standing after the music stops in a game of musical chairs."

This book is recommended for utility executives and public officials who oversee the utility industry, as well as persons with a general interest in WPPSS or the economics of nuclear power. Read together with Daniel Jack Chasan's fast-paced journalistic account, *The Fall of the House of WPPSS* (1985), Leigland and Lamb's book will provide many insights into how the WPPSS default happened.

The Service Economy: Understanding the Growth of Producer Services in the Central Puget Sound Region

by William Beyers, John Tofflemire, Harriet Stranahan, and Erik Johnson, Central Puget Sound Economic Development District, August 1986, 227 pp., $15.00.

The service industries, broadly defined, now account for three-fourths of the jobs in the American economy. Nine out of ten new jobs being created in Washington state are in services. Beyers et al have undertaken an impressive piece of research to find out more about a specialized category—the providers of *producer* services. Producer services are those sold primarily to other businesses or to government.

The study, based on some four hundred interviews, provides an in-depth analysis of the who-when-where-what and why of the producer service industry in Puget Sound. It is well-written throughout even as the style varies from the somewhat pedantic review of the literature (and an annoying misspelling of Engel's Law) to the clearly enunciated concerns of the suppliers of producer services about government. There is also extensive detail about the business characteristics of this industry.

The service industry is a dominant feature of our economy, but its diversity and complexity are just now coming under detailed empirical study. The authors note that few regions have made much of an investment in research on the development of the producer service economy, but believe this report should serve as a stimulus to a variety of ongoing development initiatives.

Pacific Northwest Employment, Hours, and Earnings Indicators

LABOR FORCE[1] / EMPLOYMENT[1] / UNEMPLOYMENT[1]
in thousands

	LABOR FORCE[1]			EMPLOYMENT[1]			UNEMPLOYMENT[1]		
YEAR	WA	OR	ID	WA	OR	ID	WA	OR	ID
1965	1.171	814	281	1.107	776	267	63	37	13
1970	1.410	865	298	1.281	803	281	129	62	17
1975	1.561	1.039	346	1.412	929	324	149	110	21
1980	1.984	1.295	430	1.828	1.188	396	156	107	34
1981	1.996	1.337	429	1.806	1.205	397	190	132	33
1982	2.024	1.324	444	1.779	1.171	401	245	153	44
1983	2.069	1.337	458	1.838	1.192	413	231	145	45
1984	2.053	1.335	463	1.859	1.210	430	194	125	33
1985	2.104	1.315	471	1.933	1.200	434	171	116	37
1986	2.179	1.347	433	2.000	1.233	402	179	114	28

AVERAGE HOURLY EARNINGS, 1986[2, 4]
by industry
in dollars

	WA	OR	ID
MANUFACTURING	**11.83**	**10.56**	**9.66**
DURABLE GOODS	**NA**	**10.87**	**NA**
Lumber and Wood Products	11.07	10.84	10.04
Furniture and Fixtures	NA	7.97	NA
Primary Metals	12.78	11.82	NA
Fabricated Metals	11.26	9.91	NA
Machinery	9.72	NA	NA
Machinery, excluding Electrical	NA	10.96	NA
NONDURABLE GOODS	**NA**	**10.26**	**NA**
Food and Kindred Products	9.50	8.60	8.21
Canning and Preserving	NA	7.31	NA
Textiles, Apparel, and Allied Products	NA	6.07	NA
Paper and Allied Products	NA	15.09	NA
Printing and Publishing	NA	11.43	NA
Chemicals and Allied Products	14.15	NA	NA
NONMANUFACTURING	**NA**	**NA**	**NA**
MINING AND QUARRYING	**NA**	**NA**	**14.89**
CONSTRUCTION	**15.06**	**13.66**	**13.38**
TRANSPORTATION, COMMUNICATION, AND UTILITIES	**NA**	**12.51**	**NA**
TRADE	**9.46**	**8.45**	**7.24**
Wholesale Trade	NA	10.47	8.04
Retail Trade	NA	7.34	6.97

NONAGRICULTURAL WAGE AND SALARY EMPLOYMENT, 1986[1, 3]
by industry
in thousands

	WA	OR	ID
TOTAL NONAGRICULTURAL EMPLOYMENT	**1,770.2**	**1,054.5**	**339.0**
MANUFACTURING	**304.2**	**196.7**	**52.2**
DURABLE GOODS	**212.6**	**142.2**	**25.4**
Lumber and Wood Products	37.9	63.9	13.2
Furniture and Fixtures	3.9	2.6	NA
Stone, Clay, and Glass Products	6.3	3.2	0.8
Primary Metals	11.8	8.5	NA
Aluminum	6.6	NA	NA
Fabricated Metals	10.0	10.6	1.9
Machinery, excluding Electrical	17.7	14.7	4.9
Electrical Equipment	12.3	13.0	2.7
Transportation Equipment	97.7	10.1	NA
Aerospace	85.0	NA	NA
Other Transportation Equipment	12.7	NA	NA
Instruments and Related Products	10.4	13.1	NA
Other Durable Goods	4.6	2.5	1.9
NONDURABLE GOODS	**91.6**	**54.5**	**26.8**
Food and Kindred Products	30.5	24.0	15.5
Textiles, Apparel, and Allied Products	6.1	3.8	NA
Paper and Allied Products	16.9	9.0	1.8
Printing and Publishing	18.7	11.6	4.2
Chemicals and Allied Products	11.5	2.1	3.4
Other Nondurable Goods	8.0	NA	1.9
NONMANUFACTURING	**1,466.0**	**859.8**	**281.7**
MINING AND QUARRYING	**2.9**	**1.4**	**2.8**
CONSTRUCTION	**85.2**	**34.1**	**14.5**
TRANSPORTATION, COMMUNICATION, AND UTILITIES	**95.8**	**57.0**	**18.6**
TRADE	**434.7**	**268.1**	**83.8**
Wholesale Trade	107.3	67.8	20.4
Retail Trade	327.4	200.4	63.4
FINANCE, INSURANCE, AND REALTY	**105.2**	**69.6**	**23.7**
SERVICE AND MISCELLANEOUS	**393.0**	**230.2**	**67.4**
GOVERNMENT	**349.3**	**199.3**	**70.9**
Federal	70.1	29.0	11.9
State and Local	279.2	170.4	59.0
Education	146.3	96.0	32.8
Other	132.9	74.4	26.2

AVERAGE WEEKLY EARNINGS[2] / AVERAGE WEEKLY HOURS WORKED[2] / NOMINAL EARNINGS PER HOUR[2]
manufacturing production workers

	AVERAGE WEEKLY EARNINGS[2] *in dollars*			AVERAGE WEEKLY HOURS WORKED[2] *in hours*			NOMINAL EARNINGS PER HOUR[2] *in dollars*		
YEAR	WA	OR	ID	WA	OR	ID	WA	OR	ID
1975	225.23	212.35	185.08	38.7	38.4	38.8	5.82	5.53	4.77
1976	248.68	236.12	204.72	39.1	38.9	38.7	6.36	6.07	5.29
1977	267.74	257.46	228.73	39.2	38.6	39.3	6.83	6.67	5.82
1978	297.11	281.97	253.36	39.3	39.0	38.8	7.56	7.23	6.53
1979	323.85	304.92	265.04	38.6	38.5	38.3	8.39	7.92	6.92
1980	361.34	329.57	280.11	38.4	38.1	37.1	9.41	8.65	7.55
1981	405.07	355.13	311.09	38.8	37.5	37.8	10.44	9.47	8.23
1982	432.36	379.76	316.35	38.5	37.9	36.7	11.23	10.02	8.62
1983	444.24	397.17	335.85	38.9	38.9	37.4	11.42	10.21	8.98
1984	450.47	409.25	351.18	38.8	39.2	37.6	11.61	10.44	9.34
1985	453.57	406.35	355.70	39.0	38.7	37.8	11.63	10.50	9.41
1986	463.74	411.84	369.01	39.4	39.0	38.2	11.83	10.56	9.66

NOTES

[1] Washington State Employment Security Department, State of Oregon Employment Division, and State of Idaho Department of Employment. Due to methodological changes, Washington data prior to 1966, Oregon data prior to 1970, and Idaho data prior to 1974 are not directly comparable to later data.

[2] Washington State Employment Security Department, State of Oregon Employment Division, and U.S. Bureau of Labor Statistics, Employment, Hours, and Earnings.

[3] Excludes workers in labor disputes.

[4] Washington data on fabricated metals, machinery, chemicals, and trade industries deviate slightly from BLS definitions, and hence are not strictly comparable to data from other states.

Cleaning Up Washington's Water

Infrastructure—roads, water and sewage systems, electric power systems, natural gas pipelines, and garbage handling and disposal systems—is a major factor in economic development, quality of life, public sector budgets, and household finances. We depend on it every day, yet seldom think about it unless confronted with a rate increase or a disruption of service.

Washington residents will be asked to finance a number of infrastructure improvement programs in the next few years. The need for these systems is driven by population increases and by federal and state environmental standards. State residents will be asked to finance several billion dollars of project costs through higher utility bills, local property taxes, and various state taxes. Just who will pay, and how much, remains to be determined.

One part of Washington's infrastructure that has been receiving attention recently is its water quality protection and treatment systems. Two studies of needed water quality projects in Washington have been carried out in response to the requirements of the federal Environmental Protection Agency, and of the Centennial Clean Water Act (hereafter, the Centennial Act) passed by the state legislature in 1986. The state Department of Ecology (DOE) has compiled an inventory of projects needed to meet federal and state environmental standards for all portions of the state outside the twelve-county Puget Sound region. The Puget Sound Water Quality Authority (PSWQA) has developed a plan for achieving water quality goals for the twelve counties surrounding Puget Sound. There are many differences in scope, time frame, and intent between these two assessments of needed water quality projects. Together they provide a detailed database for studying possible impacts of water quality programs on residential budgets, and for assessing the efficacy of state assistance programs designed to hold down sewer rates statewide.

How Much, and for What?

Cleaner water is expensive. The combined projects in the DOE and PSWQA studies would require governmental expenditures of over $3.2 billion (in 1986 dollars) by the year 2000. At an estimated cost of $2.4 billion, wastewater treatment is the single largest type of need (see Table 1). Within that category, the largest project is the $740 million secondary treatment plant to be constructed by METRO to treat sewage from King County's residents. Annual rates of expenditure statewide show a gradual downward trend the further out in time one looks (see Table 2). However, substantial outlays are projected all the way to the end of the planning horizon, and it is likely that additional projects lie just beyond the horizon.

The proposed water quality projects are scattered throughout the state, with some in every county. The northwestern section of the state has a greater dollar volume of projects in an absolute sense, and in proportion to population, than any other area (see Figure 1).

Who Will Pay?

The answer to this question is not clear. Water quality projects are undertaken by county and municipal sewer utilities, sewer districts, and other entities around the state. Each jurisdiction has a variety of options for financing projects, including property taxes, fees for monthly service, hookup fees, developer fees, and assistance from state and federal governments. The decisions made by officials running these sewer utilities will have differing implications for new and current residential, commercial, and industrial customers.

Water quality needs are also affected by local geography, population density, and other factors that drive engineering decisions. Neither nature nor population is uniformly distributed, and some areas face much higher potential costs than others. A recent financial assistance plan from the state's Office of Financial Management (OFM) examines financing options for water quality projects for the next decade. For twenty-seven sewer systems studied by OFM, potential increases in monthly sewer rates to finance projects included in the DOE and PSWQA assessments range from $1.35 (+11 percent) to $57.31 (+832 percent) with a median of $13.10 (+107 percent).

State and federal programs may help to even out the rate disparities. The Centennial Act established a Water Quality Account with primary funding from an eight cent per pack cigarette tax and backup funding from the state's general fund if needed to reach specified fund targets ($40 million in FY88 and FY89, and $45 million per year thereafter). The Centennial Act also requested a plan from OFM for use of the funds in the Account.

Table 1: Clean Water Costs by Pollution Control Category

	ESTIMATED COST MILLIONS 1986 $	PERCENT OF TOTAL
Wastewater	$2,410	74%
Combined Sewers	$223	7%
Urban Runoff	$143	4%
Nonpoint Sources	$88	3%
Groundwater	$221	7%
Lake Restoration	$161	5%
Other	$12	< 1%
TOTAL	$3,258	100%

Table 2: Clean Water Costs by Year

	ESTIMATED COST MILLIONS 1986 $
1988	$445
1989	$348
1990	$324
1991	$263
1992	$271
1993	$287
1994	$235
1995	$148
1996–2000	$187/year
TOTAL	$3,258

SOURCE: Office of Financial Management, Olympia

Pacific Northwest Regional Economic Conference

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Restructuring the Pacific Northwest Economy
21st Annual Meeting
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Seattle, Washington
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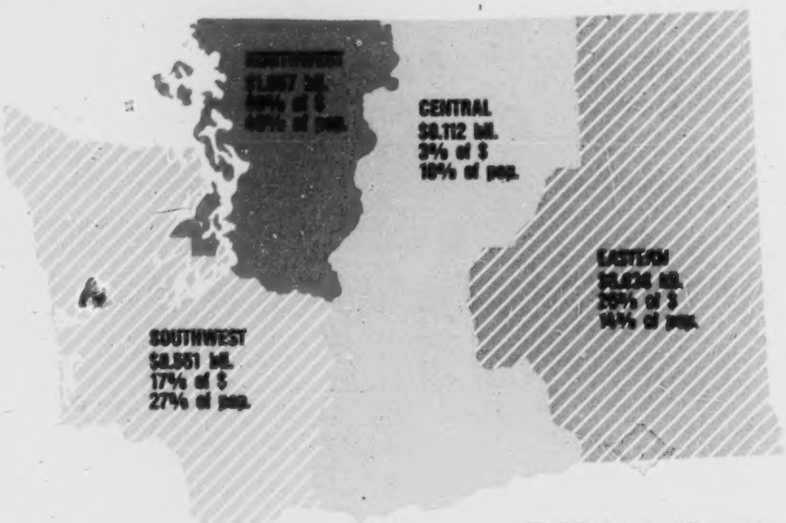
The OFM plan would involve use of state and local government general funds to finance ongoing programs, and provide assistance in the form of grants or loans from the Account to help local governments and sewer districts finance capital projects, planning, and startup costs of new programs. Four different options are contemplated (level and graduated repayment loans, initial grants, and annual grants). While the present value of each of these options is equivalent, the potential impacts on rates one year after project completion vary because the time profile of state aid varies among the options. If all twenty-seven sewer systems modeled in the OFM plan chose the 50 percent level repayment loan option, monthly sewer rate increases could range from $0.93 (+8 percent) to $40.73 (+590 percent) with a median of $11.17 (+67 percent).

Under this plan, the four standard options would reduce the size of potential rate increases, as the data above indicate. However, these standard options would not eliminate the potentially harmful impacts of very large increases in a few communities such as the city facing a 590 percent rate increase. The OFM plan suggests that the state provide additional relief for especially severe financial impacts. Extra assistance is also recommended in recognition of efforts by some communities to solve their own problems, as evidenced by higher rates or taxes, or by low levels of prior federal or state aid.

Another source of assistance is the federal government. The 100th Congress passed a Clean Water Act as one of its first pieces of legislation. President Reagan vetoed it, as he had vetoed an identical bill passed just before the 99th Congress adjourned. However, the new Congress immediately overrode the second veto.

The bill contains funds for local water quality projects, including $42 million per year for Washington communities in fiscal years 1987 through 1991. One important feature of the bill is a transition from grants to loans in the federal program starting in 1989. In past years, most federal assistance has come in the form of grants. A loan program would lead to somewhat higher costs for sewer systems, but result in the establishment of a permanent revolving loan fund administered by the state to provide assistance to future projects. Another feature of the bill is a decline in total funding starting in 1992, with the entire program zeroed out by 1995. The funding drop in 1992 combined with the requirement to shift to a loan program starting in 1989 adds up to a precipitous drop in the overall value of federal assistance to individual sewer systems.

Figure 1: Washington Water Quality Needs by Department of Ecology Region



DATA SOURCE: Office of Financial Management, Olympia

One of the unanswered and indeed unasked questions in the state's water quality studies is how much the private sector will be required to spend to meet its environmental obligations. The DOE and PSWQA assessments address only public sector costs, yet they discuss programs for industrial wastewater, agricultural pollution, forest practices, and on-site sewage control. These programs will surely require private sector investments and added operating costs. Furthermore, the OFM plan does not tackle the question of commercial and industrial sewer rate impacts; it addresses only residential rate issues. Cleaner water is a major resource in our economic development efforts, but prohibitively expensive clean water would be a major disincentive to the very firms we would like to see growing in our state. The impacts of clean water programs on commercial and industrial firms deserve a careful examination.

Rate Shock

Water quality is not the only infrastructure issue facing the state in the next decade. The downtown Seattle bus tunnel is a nagging reminder of the need to improve our transportation system, currently one of the nation's best-maintained, but subject to congestion problems at many points. Electric power projects will be on public and regulated utility agendas for many years. Even as we struggle to manage the WPPSS debt burden, new projects for interties with the Southwest, expansion of capacity in growing areas of the state, and restoration of the sites of out-of-service or abandoned projects will add new financial burdens. Garbage disposal is a mammoth problem for the entire Puget Sound area.

If Washingtonians want to preserve a high quality of life, including preservation of environmental resources, we will have to pay the infrastructure costs to achieve it. However, a slow rate of economic growth is projected for the Pacific Northwest in the remaining years of the century by several long-term forecasters. Slow growth will make infrastructure financing difficult. ıIı

Sources of Additional Information

Additional information about Washington's water quality programs can be obtained from the following documents:

Water Quality Protection Needs Evaluation. Washington State Department of Ecology, PV-11, Olympia, WA 98504, (206) 459-6069, 119 pp., free.

1987 Puget Sound Water Quality Management Plan: Environmental Impact Statement. Puget Sound Water Quality Authority, 217 Pine Street, Suite 1100, Seattle, WA 98101, 1-800-54-SOUND or (206) 464-7320, 450 pp., free.

Proposed State Financial Assistance Plan for Water Pollution Control Facilities and Activities. Washington State Office of Financial Management, Olympia, WA 98504, (206) 753-5459, 72 pp., free.

The Washington Input-Output Study for 1982: A Summary of Findings

The Washington State Input-Output Study for 1982 is the fourth of a series of economic accounts tracing the transactions taking place among industries within the state, and between Washington and the rest of the world. Prior input-output studies were published covering the years 1963, 1967, and 1972. Such studies provide a comprehensive accounting of all conventionally defined economic activities. They portray the markets in which the output of industry is sold, and the input requirements by each industry to support its production.

These input-output accounts provide a rich source of information about the economy of Washington state. First, they furnish a cross-sectional view of the purchases and sales of goods and services among industries, and thereby describe the prevailing industrial linkages or interdependencies among producers. Second, they supply an estimate of the gross state product originating within each sector of the economy, and the disposition of final products of each industry among various end uses. These uses include exports to the rest of the nation and to foreign markets. Combined with measures of imports, estimates of the external trade balances of the region become available. Third, the input-output accounts provide the basis for estimating the multiplier or "ripple" effects of changes in exports or other autonomous expenditures for the output of any given Washington industry upon other industries in the state. These various applications combine to contribute to a better understanding of the economic structure of Washington state, improved assessments of economic impacts, better forecasting, and therefore progress in economic planning.

Reading the I/O Table

The Washington Interindustry Gross Flows Table for 1982, better known as the input-output (I/O) table, is shown in the centerfold of this publication. Each row shows the sales of each Washington sector to industrial markets within the state, and to final markets. Final markets include Washington personal consumption expenditures, Washington gross private investment, Washington state and local governments, sales to the federal government, and exports to the rest of the United States and to foreign markets.

Each column of the table shows the operating inputs purchased by the sector designated at the top of the column from each row industry in Washington. All inputs are measured in producers' prices, which means that transportation costs and trade margins are shown as purchases from the Transportation Services and Trade sectors.

Value added is the contribution made by the resources employed within each sector to its gross output. Value added is gross of capital consumption allowances and indirect business taxes (but is exclusive of direct production subsidies). Not all value added accrues as income to residents of Washington state since part accrues to property owners elsewhere.

The total gross output of each sector is a measure of the value of sales, shipments, production receipts, or operating revenues depending on measures conventional to each sector. Following the practice of industrial censuses, output is measured at the establishment level, and includes interplant transfers of multi-establishment companies. The primary activity of an establishment determines its sector classification even if it also produces some output associated with other sectors (such as sawmills also engaged in logging activity). However, for some sectors such as Agriculture, Fisheries, Forestry, and Construction, output is measured on a product basis. Activities of government enterprises have been combined with their private sector counterparts. For example, Puget Sound Naval Shipyard is included in Shipbuilding and the U.S. Postal Service is included in the Transportation sector.

Income and Product Accounts

The I/O table provides a basis for measuring the income and product accounts for Washington state. Washington Gross State Product (GSP) is the sum of the value added in all sectors of the state economy. In 1982 the GSP accounted for $58.5 billion, or 1.8 percent of the nation's GNP. The details of

Using the Gross Flows Table

Much as company annual reports disclose operating revenues and operating costs, the Washington Interindustry Gross Flows Table (see pages 12 and 13) is a consolidated statement of revenue and its use for all industries in Washington state. Input-output (I/O) tables have unique accounting conventions. For example, the sources of revenue and disposition of outlays for each sector are identified spatially; the "bottom line" is not profit but value created. The gross flows table provides a useful bridge between conventional business accounting and regional economic measures such as income and employment.

To interpret the table, a reader should note that the *columns* list purchases of each sector. For example, the Field Crops sector (column 1) in Washington purchased $266 million from other sectors in the state. The largest purchase was from Industrial Chemicals. Inputs from other states ($140 million) and from foreign countries ($6 million) also occurred. Value added ($746 million) is the difference between what Field Crops output sold for and the cost of inputs from other state industries and imports. Value added is the amount available to pay wages and salaries, taxes, depreciation charges, and returns to capital.

The *rows* list the markets for the output of industries. Thus, the Feed and Seed Crops sector marketed $483 million to other industries within the state for processing, and sold $675 million to customers ranging from consumers to foreign buyers. Total sales were $1,158 million.

The I/O table is important in placing ongoing business activity in perspective. For example, the total gross output of Electrical Machinery (row 38) is dwarfed by that of Aerospace (row 39). There is more value added in Trade (column 49) than in any other sector. The prominence of entries along the diagonal cells of the table is indicative of important markets found among establishments of the same industry. Thus Services (row/column 51) sold $900 million to other Services—about 9 percent of total sales by that sector. The output of some producers is predominantly sold to out-of-state markets (e.g. Shipbuilding, sector 41) while others (e.g. Livestock, sector 3) primarily serve local markets.

GSP by industry are shown in the I/O table (value added row). A broader perspective is shown graphically (see Figure 1), with the percentage contributed by major groups in 1963 also presented for comparison purposes. These figures reveal long-term changes in the sources of GSP. The service sectors account for an increasing share of income originating within the state, while the resource-oriented and most manufacturing industries have lost shares. The commodity-producing industries are clearly making a relatively smaller contribution to the Washington economy than in years past.

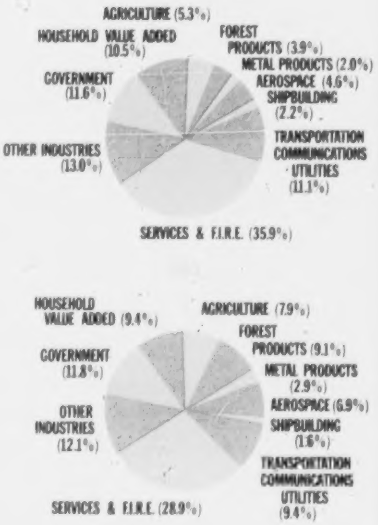
External Trade Accounts

The external trade accounts of Washington state are particularly interesting. According to economic base theory, exports are the principal source of regional economic growth. Export sales—inclusive of sales to the geographically undefined federal government—amounted to $39.7 billion in 1982. Exports to the rest of the United States are the state's largest external market (see Table 1), but exports to foreign markets have expanded more rapidly over the past two decades. According to the I/O table, Aerospace is the dominant export sector in 1982 (despite a cyclically depressed year), followed by Trade and Transportation Services. The Trade and Transportation Services sectors "export" their services by facilitating the movement of goods from producers to users, including goods transshipped through Washington state to other destinations.

Total Washington imports in 1982 amounted to $36.2 billion. These include imports from both domestic ($31.4 billion) and foreign ($4.9 billion) sources (see Table 1). Such imports, combined with the processing contribution of Washington industry, make Washington producers more efficient. Among our leading importing sectors are Aerospace (subassemblies and parts), Petroleum (crude oil for refineries), and Construction (fabricated metals and machinery become elements of construction put in place). Washington also imports large amounts of natural gas, and transportation, trade, and business services, both as operating inputs by industry and consumption by households.

Imports from the rest of the United States are Washington's dominant source of external supply, although foreign imports have risen significantly. As shown in Table 1, Washington has a large surplus ($4.1 billion) in its net foreign trade account. In fact, that surplus accounts for more than 15 percent of the $26 billion of national trade balance during 1982. It is no wonder that Washington is usually aligned with freer foreign trade policies. By contrast, Washington has a small deficit in its trade account with respect to the rest of the United States.

Figure 1: Sources of Washington Gross State Product (GSP)



Over the past two decades, the value of both exports and imports has risen faster than the growth of GSP itself. This important finding indicates that Washington state is becoming increasingly trade dependent. Federal procurement in Washington, still an unusually large market, is relatively less important than formerly, and other external markets have grown to take its place. As the state has become more export-oriented it has, at the same time, become more import-dependent. A popular notion is that as a regional economy expands, market size thresholds will be crossed, thereby stimulating import-substitution. This hypothesis of reinforced internal economic growth has not been borne out in Washington state. Broadly viewed, the propensity to import has risen as the Washington economy has expanded. Since 1963 this regional economy appears to have become relatively less self-sufficient, and its trade ties with external markets even stronger. This is a part of a national—even global—trend of greater interdependence among prospering economies of the world.

MULTIPLIERS

No topic in input-output analysis attracts more attention than multipliers because of their practicality in making estimates of economic impacts. Multipliers are predicated upon a domino theory of economic change. They translate the consequences of change in one variable upon others, taking account of sometimes very complicated and roundabout linkages. Multipliers are aptly called estimators of the "ripple" effect.

Multiplier Concepts

Although multipliers are usually expressed as a single number, they are in fact ratios. Each multiplier has a defined numerator

(continued on page 14)

Table 1: The External Trade Accounts of Washington State, 1963 and 1982
in millions $

	1963	1982	1982 AS A MULTIPLE OF 1963
TOTAL EXPORTS, BY MARKETS	**5,382**	**39,708**	**7.4**
to federal government	1,864	6,778	3.6
to rest-of-U.S.	3,041	23,957	7.9
to foreign markets	476	8,973	18.9
TOTAL IMPORTS BY IMPORTING SECTORS, ALL SOURCES	**4,568**	**36,242**	**7.9**
TOTAL IMPORTS FROM REST-OF-U.S.	**4,203**	**31,358**	**7.5**
by consumers	1,527	11,822	7.7
by industry	2,140	17,517	8.2
by investors	289	1,143	4.0
by state and local governments	247	876	3.5
TOTAL IMPORTS—FOREIGN	**365**	**4,884**	**13.4**
by consumers	81	862	10.6
by industry	284	3,625	12.8
by investors	NA	367	NA
by state and local governments	NA	30	NA
NET EXPORTS	**814**	**3,466**	**NA**
Trade with rest-of-U.S. (including federal)	703	−623	NA
Foreign trade	111	4,089	36.8
GROSS STATE PRODUCT (GSP)	**9,066**	**58,487**	**6.3**

Washington Interindustry Gross Flows Table, 1982

	Field and Seed Crops 1	Vegetables and Fruits 2	Livestock and Products 3	Other Agriculture 4	Fisheries 5	Meat Products 6	Dairy Products 7	Canning and Preserving 8	Grain Mill Products 9	Beverages 10	Other Foods 11	Textiles 12	Apparel 13	Mining 14	Forestry 15	Logging 16	Sawmills 17	Plywood 18	Other Wood Products 19	Furniture and Fixtures 20	Pulp Mills 21	Paper Mills 22	Paperboard, Other Paper 23	Printing and Publishing 24	Industrial Chemicals 25	Other Chemicals 26	Petroleum 27	Glas 28
1 Field and Seed Crops	50		[illegible]			[illegible]			41	63																		
2 Vegetables and Fruits		10						300		1	5																	
3 Livestock and Products	[illegible]	1	100			327	390																					
4 Other Agriculture				4											2													
5 Fisheries					1			77																				
6 Meat Products					1	18		5			1																	
7 Dairy Products						1	140	5			25																	
8 Canning and Preserving							2	28			6																	
9 Grain Mill Products			[illegible]					3			40							1				6	3					
10 Beverages										6	5																	
11 Other Foods			1				2	10	1	35	18																	
12 Textiles											1					1			[illegible]	1								
13 Apparel													1			2	2								1			
14 Mining											2			4								1			1		2	
15 Forestry															18	460	55	18										
16 Logging															2	383	424	88	15		13	79	77					
17 Sawmills														1			100	10	52	2	30	250	98					
18 Plywood																	1	24	17	1	5						1	
19 Other Wood Products																			20	1		1				1		
20 Furniture and Fixtures																				1								
21 Pulp Mills																	2					19	2		2			
22 Paper Mills									8		1									2	1	4	104	70	1	1		
23 Paperboard, Other Paper		2				40	20	40		15	9					2			4	1	4	6	153	2	4	2	3	5
24 Printing and Publishing								8		1	4							1						8	1	1		
25 Industrial Chemicals	[illegible]		1					2			1				8		1	1	1		20	40	20	1	32	2	6	
26 Other Chemicals															4		3	10	1			1	1	1	2	6		1
27 Petroleum	9			1	8	8	6	3	1	2	5			4	8	20	9	4	1	1	40	40	27	1	6	5	68	1
28 Glass Products							2	20		55	5														1			1
29 Cement, Stone and Clay																			2			1					2	
30 Iron and Steel																			1									1
31 Other Nonferrous Metals																											1	
32 Aluminum																												
33 Structural Metal Products																6	2	3	4								1	
34 Other Fabricated Metals																5	1		2	1	1	1		3	5	1	2	
35 Nonelect. Motive Equip																1											1	
36 Machine Tools and Shops																6	1	1	1	1	1	1						
37 Nonelect. Indust. Equip																		1									2	
38 Electrical Machinery																2	1	1	1									
39 Aerospace																									5			
40 Motor Vehicles																2												
41 Ship and Boat Building																												
42 Other Manufacturing																2	1		1	4		5			1	1	5	
43 Transportation Services			1			6	4	40	6	10	18			2	4	150	28	8	8	2	10	38	31	10	10	3	15	4
44 Electric Companies						11	4	8	1	2	2	1	1	2	1	2	12	4	2	1	15	50	25	3	18	1	12	10
45 Gas Companies						1	6	14		5	8	2	1	1			1	5	1	5	35	15	17	2	25	4	35	1
46 Other Utilities			6			1	1	2		1	1					1	1	1	1		7	4	2		4	1	1	
47 Communications			4			1	2	4	1	1	2	1	2	1	1	2	2	1	4	1	1	2	2	10	2	2	2	
48 Construction	6					1	1	1		1	2		1	1	10	66	4	2	1	1	3	10	6	2	6	2	1	1
49 Trade	4			1	1	27	26	120	20	25	28	1	4	1	6	25	38	15	28	1	20	60	55	28	30	5	30	4
50 Fin., Ins., Real Estate		3				2	3	1	1	3	3		1	1	1	6	8	2	5	1	2	6	5	4	2	2	2	[illegible]
51 Services						11	21	48	19	28	15	1	1	2	9	40	15	2	10	10	3	20	20	68	20	10	2	1
Subtotal Washington Purchases	266	131	589	18	30	482	638	763	97	354	214	7	22	32	76	1188	714	203	186	45	211	661	648	213	182	50	193	53
Value Added	746	592	291	116	56	112	114	528	50	224	298	22	85	164	517	380	321	79	167	84	92	382	314	491	543	59	564	52
Imports from Rest of U.S.	140	33	32	2	6	459	28	302	158	100	80	17	70	32	10	151	37	23	134	34	24	186	77	78	130	75	2780	7
Imports from Foreign Countries	6	3	4	0	2	38	0	1	0	16	6	4	12	10	0	9	9	6	12	1	28	24	2	85	2	1	1112	4
TOTAL GROSS INPUT	**1158**	**759**	**916**	**136**	**94**	**1091**	**780**	**1594**	**305**	**694**	**598**	**50**	**189**	**238**	**603**	**1738**	**1081**	**305**	**499**	**164**	**355**	**1253**	**1041**	**867**	**857**	**185**	**4649**	**116**
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28

Output

Cement, Stone and Clay 29	Iron and Steel 30	Other Nonferrous Metals 31	Aluminum 32	Structural Metal Products 33	Other Fabricated Metals 34	Nonelect. Motive Equip 35	Machine Tools and Shops 36	Nonelect. Indust. Equip 37	Electrical Machinery 38	Aerospace 39	Motor Vehicles 40	Ship and Boat Building 41	Other Manufacturing 42	Transportation Services 43	Electric Companies 44	Gas Companies 45	Other Utilities 46	Communications 47	Construction 48	Trade 49	Fin. Ins. Real Estate 50	Services 51	Washington Intermediary Sales Total	Washington Personal Consumption Expenditures	Washington State and Local Government Expenditures	Gross Private Domestic Investment	Federal Expenditures	Exports to Rest of U.S.	Exports—Foreign	Final Demand Total	[illegible]
																						20	483	10	1	108		62	494	675	1158
																						1	323	79	4	43		260	50	436	759
																						1	841	53	1			20	1	75	916
																			20			1	29	87	5			15		107	136
																							78	9	1		2	4		16	94
																						2	33	496	31		13	500	18	1058	1091
																						3	175	152	20		44	389		605	780
																						4	41	127	11		50	1265	100	1553	1594
																						2	138	41	2		1	69	54	167	305
																						6	25	400	1		10	251	7	669	694
																						5	75	400	27		20	70	6	523	598
																						1	8	3				38	1	42	50
																						1	15	55	1		3	111	4	174	189
20	1	1													50				40				132	4	4	50	5	40	3	106	238
																							552	13				38		51	603
																							1081						657	657	1738
													4						90			2	645					300	136	436	1081
																			40			1	94					200	11	211	305
																			60				107	11	11	10		359	1	392	499
																			4				16	40	10	12	6	80		148	164
																							25					170	160	330	355
																				80	2	14	300	5	7		16	669	256	953	1253
																				80	9	2	396	60	15		13	494	63	645	1041
																				250	80	100	497	180	75		5	100	8	368	865
																				4	1	10	265	5	7		425	100	55	592	857
																						6	117	24	1		3	37	3	68	185
40			20							10				564					140	80	10	190	1522	1198	78	52	100	1546	133	3107	4629
																						1	83	2	3		1	26	1	33	116
50																			280			1	349	6	2			37	19	64	413
	4		2	25	20	5	2	8											80				158		1		1	145	1	148	306
																							35					172	50	222	257
		40	450	20	40																		570	1				1379	100	1480	2050
				18															190				247	1	6	31	12	270	15	335	582
1	2		1	5	5	8		3	25	15	4											6	257	30		26	2	151	54	263	520
						14																	25		2	40	8	206	125	381	406
			3	3	6	8	9	12	5	50												15	132	5	4	3	3	47	3	65	197
			2	1		6		6	2	7		2	1	4	1							5	46	1	2	10		434	113	560	606
			2			4		4	18	18	1	1	2	4	1			12	15			3	96	2	1	13	16	712	67	811	907
				10					4	200	4	5		15									243			76	1200	[illegible]	[illegible]	8693	8936
				1		1		1			1	1		4								5	19	13	3	11	30	400	26	483	502
												3		30									38	50	1	26	1550	[illegible]	25	1852	1890
			4		8	1	1	1	9	13	2	2	20	1	1			4	31	20	6	56	209	8	10	35	25	816	33	927	1136
15	6	6	40	5	4	1	1	1	6	41	2	6	13	360	6	1	1	6	75	200	20	100	1361	754	100	23	85	2666	128	4156	5517
9	18	10	278	2	2	1	1	1	2	20	2	10	3	25	520	2	9	9	11	220	50	125	1564	808	96		[illegible]	[illegible]		1001	2565
1	6	6	27	2	1	2			1	10	1	1	1	6	3	487		1	4	31	10	80	874	200	25		10	35		270	1144
1					1			1		5	1	2	1	2	1		25	2	2	30	6	20	156	150	18		3			171	327
2			1	2	3	2	1	3	4	20	2	2	6	35	10	3	2	13	20	200	116	200	707	900	80	25	10	165	25	1205	1912
4	4	1	3	1	1	1		2	9	4	1	12	1	21	16	1	3	10	6	70	60	50	417	155	2887	2775	298			6115	6532
11	14	1	26	13	11	14	4	20	30	20	12	96	25	79	10	1	1	11	283	225	14	275	1827	8000	106	250	[illegible]	[illegible]	1440	13173	15000
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16	6	3	15	10	20	9	6	20	22	199	6	16	5	170	25	2	5	91	250	1014	300	900	3519	5500	550		200	885	82	7217	10736
76	73	75	899	131	140	87	29	97	143	663	52	148	138	1510	669	501	50	188	1729	2694	967	2413	21838	21565	4302	3579	4325	23957	28973	66696	88534
94	162	60	470	238	215	161	124	333	522	2700	209	1260	708	2859	1675	175	269	1500	3275	11000	2686	7308	45564	6159	4316		2458			12933	58487
30	71	106	281	153	102	106	43	146	200	5020	239	479	176	965	211	43	8	212	1480	1156	140	965	17517	11822	876	1143				13841	31358
13	0	16	400	62	63	50	1	30	42	553	2	3	114	183	10	425	0	12	48	150	7	50	3625	862	30	367				1259	4884
13	306	257	2050	582	520	406	197	606	907	8936	502	1890	1136	5517	2565	1144	327	1912	6532	15000	3800	10736	88534	40408	9524	5089	6778	23857	8973	94729	183263
	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51									

(continued from page 11)

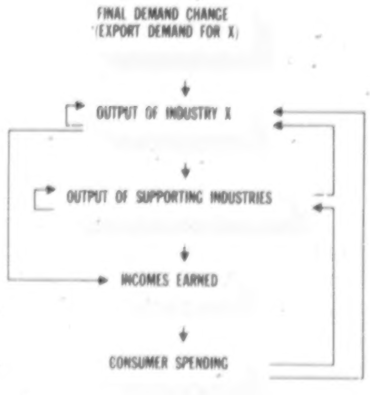
and denominator; often overlooked is the exact definition of the terms in a multiplier ratio, and the underlying interindustry relationships that the ratio summarizes. Inexact definition or inappropriate application has been a source of much confusion about the size of multipliers. The most important thing to remember is that there are a variety of multiplier concepts. Estimates of the size of multipliers differ depending upon the following:

- the *degree of closure* of the underlying economic model;
- the *kind of variable* involved (output, value added, earnings, jobs); and
- the *form of the multipliers* (total impact per dollar of final demand versus total impact per unit of direct impact).

Degree of Closure. By degree of closure is meant the span of economic repercussions that the underlying economic model takes into account. Type II multipliers are presented here because this variant is most widely used in regional impact analysis. Type II multipliers measure the direct impacts upon a variable, plus the indirect impacts that arise as the result of interindustry linkages, plus the impacts induced by households spending income paid to them. Inclusion of households assumes there is a systematic linkage between industry output and household income, and a further regularity between household spending and income. Type I multipliers, which omit household spending effects, are smaller. Other multipliers, which incorporate general state and local government spending (Type III) or additionally assume that investment spending (Type IV) is automatically responsive to the demand for output, are larger but more speculative. Still other multipliers, including time-phased (or dynamic) multipliers, may also be constructed.

The range of spending reactions incorporated within Type II multipliers is shown in Figure 2. An external source of demand such as an increase in export demand has a direct influence upon the output of some specific exporting industry. To produce that output, the impacted industry makes purchases from supporting sectors, and perhaps there are some intrasector purchases as well. The supporting sectors in turn make purchases from each other, and possibly from the export industry. As output levels of many industries rise in response to the initial impact, income payments rise, too, and portions of these are used by consumers to purchase outputs from Washington industries, extending the output reactions further. The effects of all these demand repercussions are accumulated in a matrix of output multipliers.

Figure 2: Linkages in Type II Multiplier Model



Kind of Variable. Multipliers may be constructed for different kinds of variables. Any variable that changes (or can be assumed to change) systematically with output is capable of being expressed in multiplier form. Those in this article (see Table 2) are *earnings* and *jobs* multipliers. In their formulation we have adopted the U.S. Department of Commerce definition of earnings (labor and proprietors' income) and jobs (part-time and full-time workers, self-employed, and family workers). Other multiplier variables such as output, value added, pollution, or energy use multipliers are also used in economic impact analyses.

Form of the Multiplier. The form of the multiplier expression is also important. Sometimes multipliers are expressed "per million dollars of output sold to final users." Final use, or final demand, depends on degree of closure; the multipliers in Table 2 are applicable to exports, investment spending, and exogenous government spending. Alternatively, the multiplier effects of final demand in Table 2 may be expressed "per unit of direct impact" upon a sector, as in columns 3 and 4.

Beyond these three major concepts there are a number of more technical considerations such as assumptions concerning the form of production and consumption functions. Readers are referred to the Washington input-output studies, and input-output literature generally, for details. The standard multipliers shown in Table 2 represent the author's opinion of the most useful Type II multipliers for earnings and jobs for industries in the Washington economy.

For example, the earnings multiplier (column 1, Table 2) for Sector 1 (Field Crops) informs us that for each million dollars of final demand, there is associated with it a total of $561,000 of earnings in *all* of the industrial sectors within Washington state. The job multiplier tells us that 30.6 jobs *in Washington's economy* are generated. The number of direct jobs per million dollars of sales by Sector 1 is 14, and the number of indirect and induced jobs is 16.6; the ratio of the direct, indirect, and induced to direct (30.6/14) is the jobs multiplier, 2.19, in column 4. The direct earnings in Field Crops per million dollars of output is $301,000; the ratio of total earnings to direct (561/301) is 1.86. It is apparent that columns 3 and 4 are mathematically derived from columns 1 and 2, but differ because of the denominators in their expressions.

A scan of the multipliers in Table 2 suggests some of unusual size. The job multiplier (column 4) for Dairy Products is extremely large, a phenomena explicable by the fact that there are very few direct jobs (2.4) per million dollars of output in

Use of Multipliers: A Simple Illustration

In 1986, Boeing announced a firm order from All Nippon Airways for $1.5 billion of aircraft. What are its probable impacts upon the Washington economy? Assuming the procurement patterns shown in the gross flows table (see pages 12 and 13) are applicable, then the economy-wide earnings and jobs impacts may be estimated with the help of Table 2, columns 1 and 2:

State Variable	Aerospace Multiplier		Direct Aerospace Exports		Estimated Economy-wide Impact
Earnings	$.440	×	1,500 million	=	$660 million earnings
Jobs	17	×	1,500 million	=	25,500 jobs

The total impacts shown include earnings and jobs in *all* sectors of the Washington economy, not just in the Aerospace sector. These total impacts are over the lifetime of the contract, not on a per-year basis. If deliveries are scheduled over five years on an even flow basis, the per annum impacts are easily deduced. The jobs estimate assumes 1982 productivity rates; this should be adjusted to reflect expected productivity change in Aerospace and other sectors. If capacity constraints dictate additional investment by Aerospace or by other sectors, these added impacts should be taken into account by further multiplier analysis.

Table 2: Standard Earnings and Jobs Multipliers for Sectors of the Washington Economy
direct, indirect, and induced effects

SECTOR NUMBER AND INDUSTRY NAME	Total impact per million $ of direct final demand upon (1) EARNINGS	(2) JOBS	Total impact per direct impact upon (3) EARNINGS	(4) JOBS
1 Field Crops	$561 thousand	30.6	$1.86	2.19
2 Vegetables and Fruits	$673	50.7	$1.63	1.51
3 Livestock and Products	$610	59.3	$3.14	1.83
4 Other Agriculture	$929	87.0	$1.45	1.30
5 Fisheries	$888	133.7	$1.55	1.19
6 Meat Products	$373	28.3	$4.52	7.65
7 Dairy Products	$622	48.1	$7.47	20.05
8 Canning and Preserving	$555	40.0	$3.50	4.25
9 Grain Mill Products	$338	19.0	$3.43	4.42
10 Beverages	$487	25.9	$3.71	5.29
11 Other Foods	$548	30.5	$2.26	2.85
12 Textiles	$542	36.4	$1.51	1.52
13 Apparel	$612	48.2	$1.50	1.40
14 Mining	$974	36.2	$1.40	2.00
15 Forestry	$246	22.2	$5.30	2.45
16 Logging	$633	32.6	$2.70	3.98
17 Sawmills	$792	42.2	$2.67	3.06
18 Plywood	$716	38.5	$2.80	3.19
19 Other Wood Products	$740	39.6	$1.97	2.23
20 Furniture and Fixtures	$609	38.9	$1.92	1.94
21 Pulp Mills	$542	25.2	$2.56	4.07
22 Paper Mills	$595	28.6	$3.12	5.03
23 Paperboard & Other Paper	$648	31.8	$3.37	4.82
24 Printing and Publishing	$685	39.1	$1.83	2.04
25 Industrial Chemicals	$555	24.8	$1.81	2.73
26 Other Chemicals	$449	24.3	$2.08	2.51
27 Petroleum	$52	2.6	$2.95	8.56
28 Glass Products	$578	30.4	$2.24	2.51
29 Cement, Stone, and Clay	$652	33.1	$2.15	2.53
30 Iron and Steel	$529	25.9	$1.88	2.47
31 Other Nonferrous Metals	$475	20.0	$1.70	2.15
32 Aluminum	$350	16.1	$2.20	4.03
33 Structural Metal Products	$502	23.5	$1.78	2.28
34 Other Fabricated Metals	$428	22.3	$2.27	2.82
35 Nonelectrical Motive Equipment	$543	24.8	$1.74	2.34
36 Machine Tools and Shops	$764	35.5	$1.52	1.89
37 Nonelectrical Industrial Equipment	$596	29.6	$1.86	2.04
38 Electrical Machinery	$481	25.9	$1.83	2.20
39 Aerospace	$440	17.0	$1.43	2.00
40 Motor Vehicles	$253	12.6	$2.22	3.49
41 Ship and Boat Building	$616	27.0	$1.49	1.96
42 Other Manufacturing	$507	28.7	$1.66	1.83
43 Transportation Services	$624	29.5	$1.62	2.02
44 Electric Companies	$357	17.1	$2.86	5.03
45 Gas Companies	$127	6.3	$3.37	4.82
46 Other Utilities	$438	33.7	$2.07	1.83
47 Communications	$617	28.0	$1.64	2.26
48 Construction	$753	36.4	$1.68	2.11
49 Trade	$712	49.8	$1.71	1.65
50 Finance, Insurance, Real Estate	$854	64.4	$1.75	1.61
51 Services	$962	67.6	$1.54	1.51
AVERAGE	$571	34.7	$2.35	3.16
MEDIAN	$578	30.4	$1.92	2.28

Dairy Products; the indirect job impacts are substantial (particularly via the livestock linkage). In contrast, the total jobs per direct jobs in Fisheries of 1.19 is very low because the direct jobs (133.7) per million dollars of output is very high. This is not surprising; Fisheries has weak procurement impacts on other sectors, but has a very large number of direct (mostly part-time) jobs. In this context it is worth pointing out that the output of Washington fisheries is measured by the value of catch landed in the state, and its multiplier does not include the considerable procurement impacts of the Alaska fisheries.

Understanding Multipliers

There are many misconceptions about multipliers. Here are a few warnings that readers should consider.

- There is no such thing as "the" multiplier for an industry. There are different multipliers depending upon the form in which the multiplier is expressed, the variable under consideration, the range of repercussions encompassed by the multiplier model, and the theories of interaction used to construct them.
- Multipliers for a variable can be made to look large or small depending on the unit of expression chosen for the denominator of the multiplier ratio. Export multipliers that express total jobs per direct jobs will be smaller (other things being equal) than multipliers that express jobs per million dollars of output exported.
- Large multipliers do not necessarily mean big impacts. The magnitude of impacts depends on *both* the size of the multiplier and the magnitude of the disturbance to be multiplied. Sectors with large multipliers are sometimes those in which significant external market changes, such as changes in exports, are unlikely.
- The size of a multiplier depends on the scope of interactions incorporated in the multiplier model. Multipliers including households will be larger than those excluding the repercussions associated with household spending. Multipliers including government spending or investment spending reactions will be larger still.
- Users should avoid the pyramiding of multiplier impacts. Multipliers should be used to assess the impact of events that are external to the multiplier process itself, thereby avoiding double-counting. Applications include evaluating the impacts of changes in exports, of federal expenditures, and of investment outlays.
- Impacts often have displacement effects.

Positive multiplier effects of public undertakings should be accompanied by a consideration of the negative income effects on taxpayers who finance public projects. Substitution effects should be evaluated.

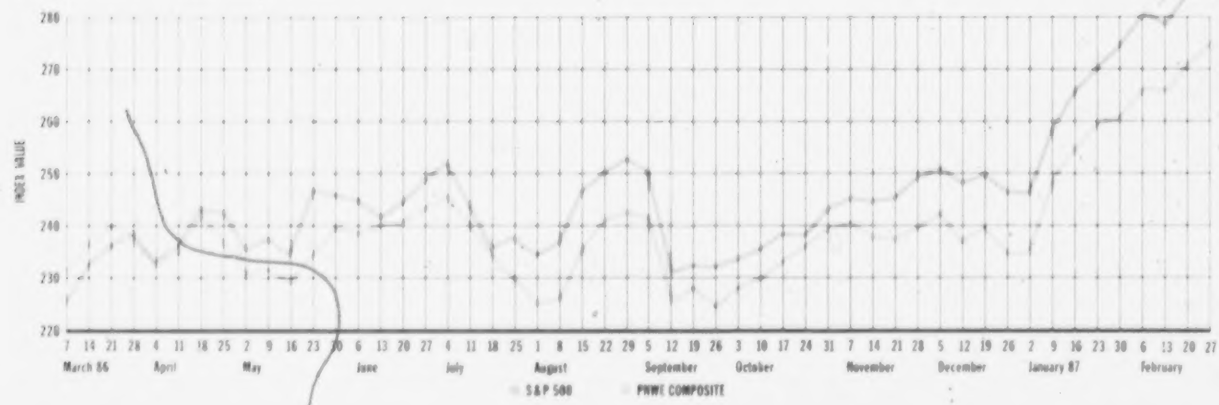
- Multipliers in static models are timeless. Production adjustments may take place in anticipation of changes in market demand; on the other hand, reaction lags may result in delayed multiplier responses. Furthermore, inventories serve as a shock absorber enabling producers to spread over time the impact of changing market conditions. These and other complications make the time period before the full multiplier effects become operative quite uncertain.
- Ready-made multipliers such as those included in the I/O study for 1982 are representative of establishments within each sector, but are not applicable to any specific instance. For example, the multipliers for Printing and Publishing are descriptive for the industry as a whole but not necessarily for a particular establishment within that sector. Analysts must use their judgment, or undertake collateral analysis, to determine whether the standard multipliers are applicable to a particular case.
- Multipliers in this I/O report are applicable to the Washington economy, but not to its subdivisions (counties or cities). In general, the smaller the economic area, the greater will be the import propensities of producers and consumers and hence the smaller will be the multipliers.
- Empirical estimates of multipliers are based on interindustry relationships observed in a particular historical context (in this case, 1982), and may not be applicable in different cyclical phases. However, the relative (rank ordering) of multipliers for different industries is fairly consistent over the four input-output studies for Washington state.

An enumeration of some of the common pitfalls associated with the use of multipliers may be helpful to readers, but ready-made recipes are seldom applicable to particular instances. In each potential application there is no substitute for sound economic analysis. That kind of analysis arises out of an understanding of the structure of input-output models in particular and economic theory in general. ılı

University of Washington Professor Philip J. Bourque is the author of The Washington State Input-Output Study for 1982. *Support for the project was provided by the Washington State Legislature through the Washington State Institute for Public Policy.*

The Pacific Northwest Executive Stock Index

S&P 500 and the PNWE Index

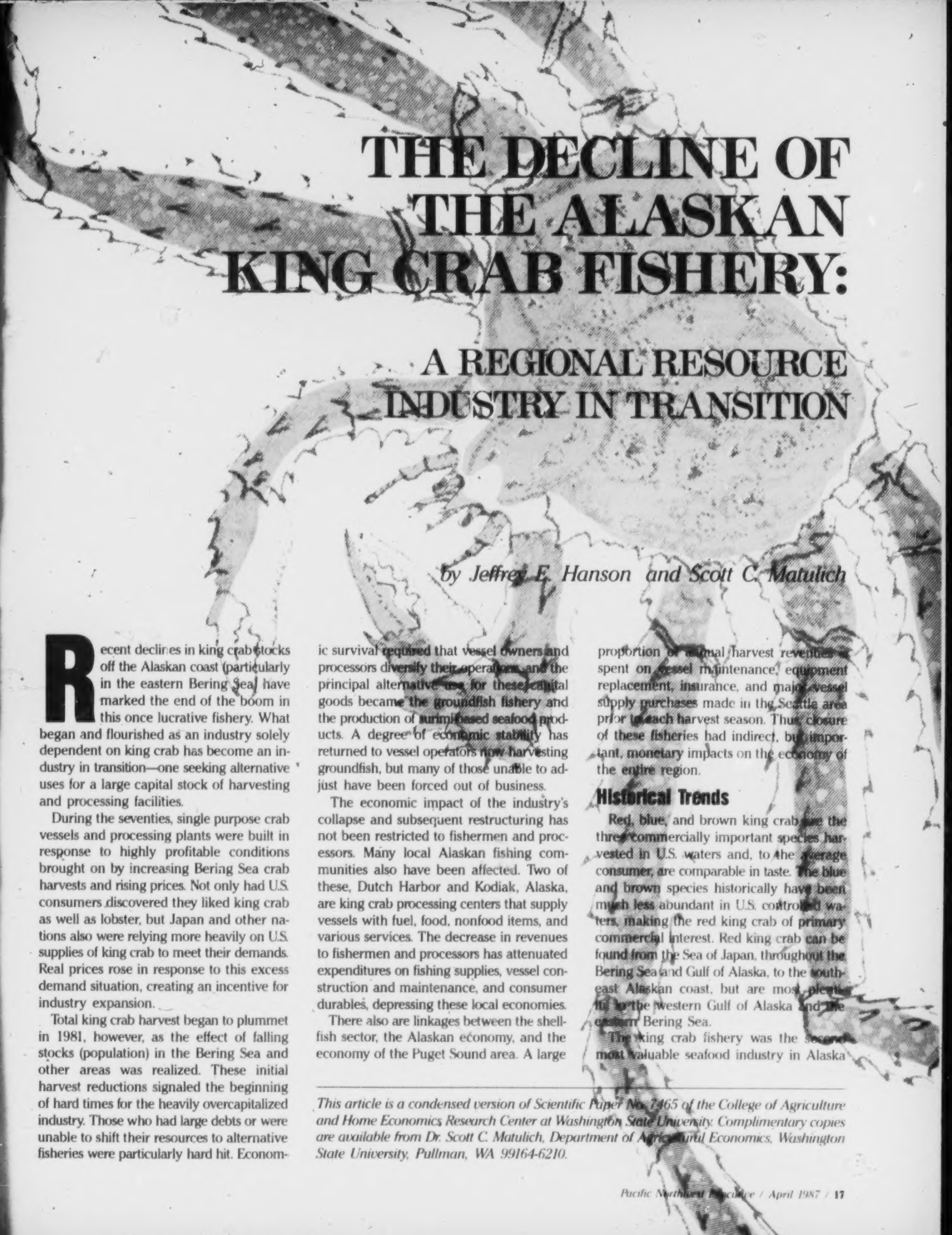


Index Values*

LAST FRIDAY OF	PNWE COMPOSITE	SMALL FIRMS	LARGE FIRMS	MANUFACTURING	TECHNOLOGY	UTILITIES	RETAIL FINANCE & OTHERS
MAR 1986	239.35	250.53	238.72	242.72	207.11	234.51	247.36
APR 1986	238.30	273.93	237.87	241.46	226.23	235.14	239.77
MAY 1986	241.45	283.42	241.88	245.89	232.74	233.24	242.30
JUNE 1986	245.10	282.08	248.63	250.74	218.67	247.14	243.57
JULY 1986	230.07	280.99	234.04	233.16	196.69	260.12	219.14
AUG 1986	242.89	282.59	248.46	245.72	192.38	269.67	233.74
SEPT 1986	224.44	290.66	229.31	225.69	186.62	244.92	217.78
OCT 1986	239.01	321.75	242.98	238.66	213.39	254.76	236.37
NOV 1986	239.78	316.58	241.11	238.09	231.63	257.59	232.97
DEC 1986	234.36	337.84	234.59	239.09	223.23	247.44	221.15
JAN 1987	260.12	368.42	251.99	266.74	285.37	261.00	239.52
FEB 1987	276.29	401.15	266.71	284.67	302.00	254.23	265.12

*All PNWE indexes set equal to the S&P 500 index of 210.88 on January 3, 1986

►Kay Pilcher, editor of the Pacific Northwest Executive since its commencement, is leaving the staff to celebrate the birth of her second child. Kay has set a standard of professional excellence that will continue to challenge us. We are grateful for her many contributions and wish her well.



THE DECLINE OF THE ALASKAN KING CRAB FISHERY:

A REGIONAL RESOURCE INDUSTRY IN TRANSITION

by Jeffrey E. Hanson and Scott C. Matulich

Recent declines in king crab stocks off the Alaskan coast (particularly in the eastern Bering Sea) have marked the end of the boom in this once lucrative fishery. What began and flourished as an industry solely dependent on king crab has become an industry in transition—one seeking alternative uses for a large capital stock of harvesting and processing facilities.

During the seventies, single purpose crab vessels and processing plants were built in response to highly profitable conditions brought on by increasing Bering Sea crab harvests and rising prices. Not only had U.S. consumers discovered they liked king crab as well as lobster, but Japan and other nations also were relying more heavily on U.S. supplies of king crab to meet their demands. Real prices rose in response to this excess demand situation, creating an incentive for industry expansion.

Total king crab harvest began to plummet in 1981, however, as the effect of falling stocks (population) in the Bering Sea and other areas was realized. These initial harvest reductions signaled the beginning of hard times for the heavily overcapitalized industry. Those who had large debts or were unable to shift their resources to alternative fisheries were particularly hard hit. Economic survival required that vessel owners and processors diversify their operations, and the principal alternative use for these capital goods became the groundfish fishery and the production of surimi-based seafood products. A degree of economic stability has returned to vessel operators now harvesting groundfish, but many of those unable to adjust have been forced out of business.

The economic impact of the industry's collapse and subsequent restructuring has not been restricted to fishermen and processors. Many local Alaskan fishing communities also have been affected. Two of these, Dutch Harbor and Kodiak, Alaska, are king crab processing centers that supply vessels with fuel, food, nonfood items, and various services. The decrease in revenues to fishermen and processors has attenuated expenditures on fishing supplies, vessel construction and maintenance, and consumer durables, depressing these local economies.

There also are linkages between the shellfish sector, the Alaskan economy, and the economy of the Puget Sound area. A large proportion of annual harvest revenues is spent on vessel maintenance, equipment replacement, insurance, and major vessel supply purchases made in the Seattle area prior to each harvest season. Thus, closure of these fisheries had indirect, but important, monetary impacts on the economy of the entire region.

Historical Trends

Red, blue, and brown king crab are the three commercially important species harvested in U.S. waters and, to the average consumer, are comparable in taste. The blue and brown species historically have been much less abundant in U.S. controlled waters, making the red king crab of primary commercial interest. Red king crab can be found from the Sea of Japan, throughout the Bering Sea and Gulf of Alaska, to the southeast Alaskan coast, but are most plentiful in the western Gulf of Alaska and the eastern Bering Sea.

The king crab fishery was the second most valuable seafood industry in Alaska

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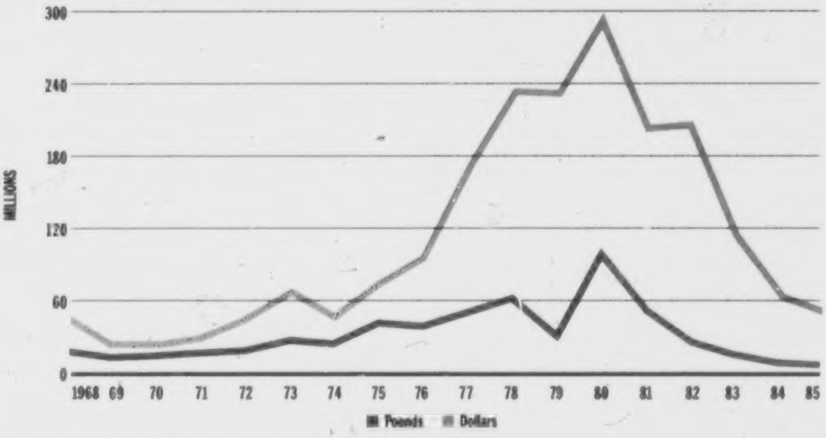
This article is a condensed version of Scientific Paper No. 7465 of the College of Agriculture and Home Economics Research Center at Washington State University. Complimentary copies are available from Dr. Scott C. Matulich, Department of Agricultural Economics, Washington State University, Pullman, WA 99164-6210.

Figure 1: Annual Production and Wholesale Value of Processed King Crab for Alaska



from 1968 until 1983. Production of processed king crab rose steadily from 1968 until the record harvest of 1980 (see Figure 1). Total wholesale value and average market prices also increased (both in nominal and real terms), reflecting shifting demand by consumers as tastes and preferences changed. Total production began falling in 1981. Despite rising market prices, total revenue also began trending downward.

Nine vessels harvested Bristol Bay king crab in 1966; 236 vessels were employed in the area by 1980. Characteristics of the fleet also changed: vessel length and mean net tons generally increased while mean vessel age declined, with most of the new vessels constructed by firms in the Puget Sound area. Hence, the capital stock improved and became more efficient.

The final, and perhaps most important trend is the annual abundance estimate for king crab in the dominant harvest area—the Bering Sea fishery (see Figure 2). The three categories reported (legal males, adult females, and total estimated crab population) show two periods of decline separated by a lengthy growth period. The decline beginning in 1977–78 generally persists today and has been experienced in the other harvest areas as well.

Causes of the Crisis

How could the king crab fishery go from boom to bust so quickly? The answer to this question is neither obvious nor simple, but it is predictable. Unanticipated changes in population density combined with low abundance of young crab entering the fishery led to larger than expected reductions in total adult and juvenile stock. Changing environmental conditions and increased harvest pressure probably caused the higher mortality and subsequent population decline.

Three environmental factors are suspected of increasing the king crab mortality: (1) incidence of disease, (2) larger population densities of halibut and cod species, and (3) fluctuating water temperatures. Recent surveys of king crab stocks have revealed the presence of viral and microsporidian diseases, both of which may be fatal or cause sterility in heavily infected females. The extent to which these diseases contributed to the most recent population decline is not known, but both state and federal management biologists are greatly concerned. To date, there is no known corrective action that can be taken to solve this problem.

Halibut and cod population densities increased during the late seventies, particularly in the Bering Sea area. It is suspected that both species may prey upon king crab, with smaller crab being especially vulnerable. The extent to which management was responsible for increased halibut and cod densities suggests the need for a broader, multispecies view of fisheries management. Failure to manage all three fisheries jointly may lead to a species imbalance that disrupts the natural population dynamics of the system, thereby accentuating natural mortality. Unfortunately, multispecies fishery management may require a degree of knowledge and control that currently does not exist.

Finally, warming of sub-Arctic waters by the El Nino current is believed by some experts to have had a negative impact on the temperature-sensitive king crab. Very little could have been done to mitigate the impact of this temperature change except by regulating the total harvest.

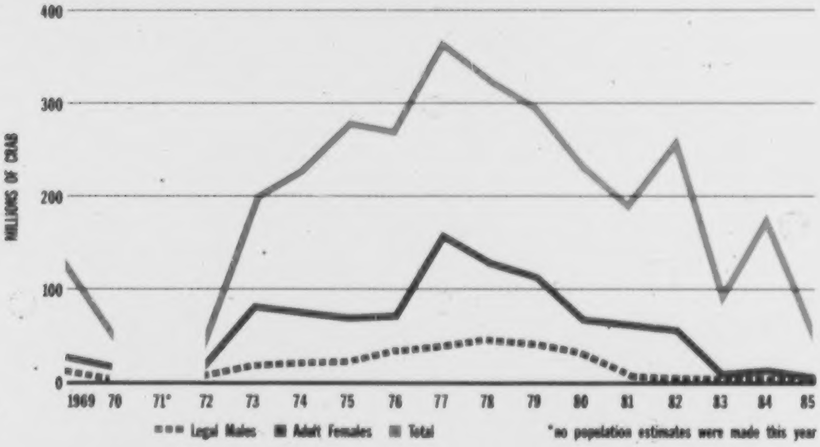
Expansion of harvesting in response to demand for processed king crab products compounded these environmental influences. Not only had the number and size of vessels increased, but the amount of gear each vessel used also expanded. The average number of pots used to fish crab in the eastern Bering Sea was 240 per vessel in 1977, whereas by 1981 it was 428 per boat. The impact of expansion in the amount and intensity of effort was twofold. First, the expanded fleet was catching a larger quantity of crab, which in hindsight may have amounted to overharvesting. Second, the increased number of pots probably led to added handling stress on female and undersized male (nonlegal) crab and an increase in lost pots that kept catching crab. In all cases, increased crab mortality resulted.

The expanded use of combined catcher/processor vessels during the late seventies and early eighties also may have played a role in the decline. Most vessels must leave the fishing grounds every few days to deliver harvested crab to a processing facility. The catcher/processor boats, however, are able to stay on the fishing grounds and fish/process nonstop for several weeks, if not for the entire harvest season. As a result, fewer crab in a local stock escape the king crabbers' pots, and monitoring for nonlegal crab by Alaska Department of Fish and Game biologists is more difficult.

Impacts of the Decline

Suspension of commercial fishing in the eastern Bering Sea, Dutch Harbor, South Peninsula, and Kodiak red king crab fisheries in 1983 and subsequent years was intended to allow the dwindling stocks to recover. Inability to harvest red king crab, however, idled boats, fishermen, processing plants, and plant workers, and reduced the demand for support services, thus beginning the transition within the industry. Vessel and processing plant owners could not afford to keep their capital assets sitting idle. Some enterprises failed. Other operations, especially the large Bering Sea vessels and floating processors, were moved to other areas within Alaska where limited king crab harvests were still permitted. Most of the alternative areas, however, had contributed significantly fewer crab to the total harvest, and as a consequence had been dominated by small, locally owned vessels. Serious distributional problems resulted from such a resource shift. The larger, more efficient vessels captured a greater percentage of the limited stocks. This issue remains a concern to the state and, in part, motivated the re-

Figure 2: Annual Estimates of Red King Crab in the Eastern Bering Sea



cent implementation of a permit system that limits entry into the southeast Alaskan king crab fishery.

King crab vessels also shifted to alternative fisheries, e.g., the burgeoning groundfish fisheries. Surimi-based seafood products, currently being marketed throughout much of the United States, owe part of their rapid growth in popularity to the decline in king and Tanner (snow) crab harvests. Movement into the groundfish fishery was by joint venture whereby American vessels delivered their catch to foreign-owned floating processors. The first joint ventures began in 1980 and were negotiated by fishermen who had retrofitted their wholly owned vessels for trawling. In time, however, participation in joint ventures increased.

Loan foreclosures on heavily financed king crabbers resulted in a general recapitalization of the fleet, as foreclosed vessels typically were auctioned off at 30 to 40 percent of their assessed value. Recapitalization of the fleet allowed for greater movement of resources into the less lucrative, but expanding, groundfish industry. This, in turn, contributes to the likelihood of transferring the overcapitalization problem to the groundfish fishery and replicating the boom-bust cycle characteristic of the king crab fishery. Impacts to the fishery must be monitored closely so that the management and industry participants can plan appropriately for fluctuating conditions.

New Strategies Needed?

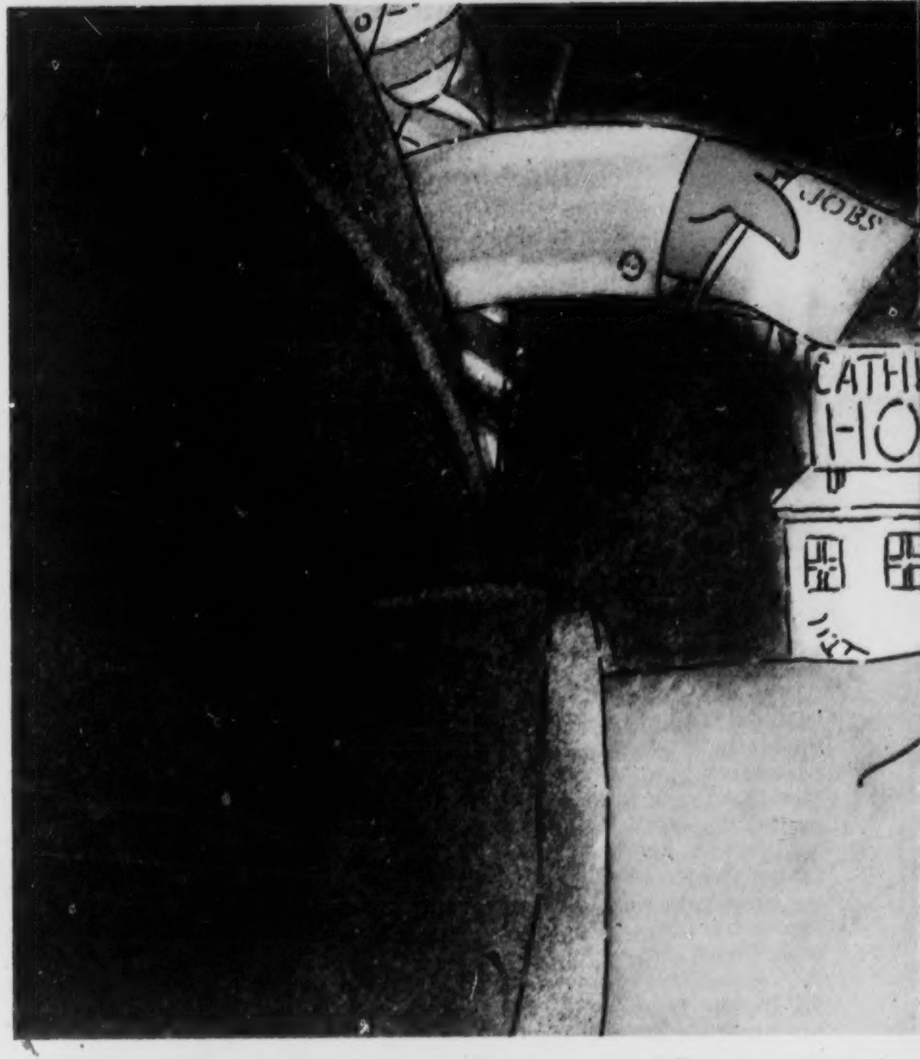
Two interrelated characteristics of "open-access" fisheries—depletion of fish stocks and overexpansion of the fishing industry—are widely recognized as contributing to significant economic losses, especially in valuable, highly productive fisheries. The Alaskan king crab fishery exemplifies both characteristics. In fact, management policies directed at the fishery enlarged the natural overexpansion of capital stock. Low interest and guaranteed federal and state loan programs encouraged investment in new vessels and processing facilities during the seventies. Hindsight clearly portrays these government policies as counterproductive. A major strategy for government agencies should be to eliminate policies that encourage excess capacity. Excess capacity only hampers the ability of the industry to survive fluctuations within the fishery.

Although speculative at this stage, alternative management systems might have lessened the extent of collapse experienced in the king crab fishery. Two critical elements to improved fishery management and policy formation are better knowledge of fishery trends and of market response to these trends. Unfortunately, inadequate data collection and paucity of knowledge about the economic structure of the market for king crab precluded any effective institutional response. Although studies have been undertaken to model the causal relationships impacting the king crab industry, these studies are few in number, somewhat oversimplified, and fail to link king crab population response expectations with economic and market relationships. Market research must be conducted so that policy makers have a better understanding of the industry and its relationship to the fishery. Enforcing complete and accurate reporting of harvest data on fish tickets would greatly enhance the amount and quality of information on the fishery and improve the ability of agencies to predict market responses to changing harvest conditions. Only with improved data collection and reporting can statistical modeling of the industry be done so that the proposed policy changes can be evaluated prior to their implementation.

Research funded by the Alaska Department of Fish and Game and the National Marine Fisheries Service is increasing our knowledge of this marine resource industry. However, there is little hope of altering the impact of changing environmental conditions on king crab. Unlike salmon, there are no known ways of controlling or enhancing natural stock levels of king crab; society must take the natural supply as given. However, recognition of the unpredictable influence of environmental forces on population density and the importance of jointly managing king crab and potential predator species such as cod may promote more perceptive regulation of the industry. This realization, when combined with greater knowledge of the market characteristics of the industry, can provide opportunities for stabilizing the influence of changing population levels on the industry and minimize negative economic impacts to fishermen, processors, and local communities.

The Bering Sea king crab fishery is showing very weak signs of an upturn in harvest. The 1986 king crab harvest from the Bristol Bay portion of the Bering Sea was 11.4 million pounds. This represents an increase of 7.2 million pounds over the 1985 harvest. Concern remains, however, as to the strength of this trend reversal. Whether the trend reversal continues depends on several factors. The key element is how quickly the crab stocks recover. National Marine Fisheries Service biologists hope stocks will recover within the next six years, but there is no sign of recovery yet. Another factor is how well vessel owners survive the period of potentially poor returns from the crab industry and move into alternative fisheries. The final consideration is how effective government policy makers can be in devising new regulatory and management strategies for the red king crab fishery as well as the cod, halibut, and groundfish fisheries.

Jeffrey Hanson was formerly an economist with the National Marine Fisheries Service and a graduate research assistant in agricultural economics at Washington State University. He is currently an assistant professor of fishery and wildlife economics at Michigan State University, East Lansing. Scott Matulich is an associate professor of agricultural economics at Washington State University.



Ambassadors for Ec

by Laura Brenner

A small town in southwest Washington has just lost its major source of employment and income. The company, perhaps it produced plywood, has moved its operations to a site nearer complementary facilities. In its wake it has left unemployed workers, empty buildings, and a sense among town leaders of not knowing what to do to revitalize.

Cathlamet, situated on the Columbia River in Wahkiakum County, is such a town. Heavily dependent on forestry, fisheries, and agriculture, Cathlamet is now faced with a seriously waning economy. Unemployment hovers around 10 percent in the town of 650 people. In 1983 its only hotel and restaurant, the only hotel and restaurant in the entire county, closed.

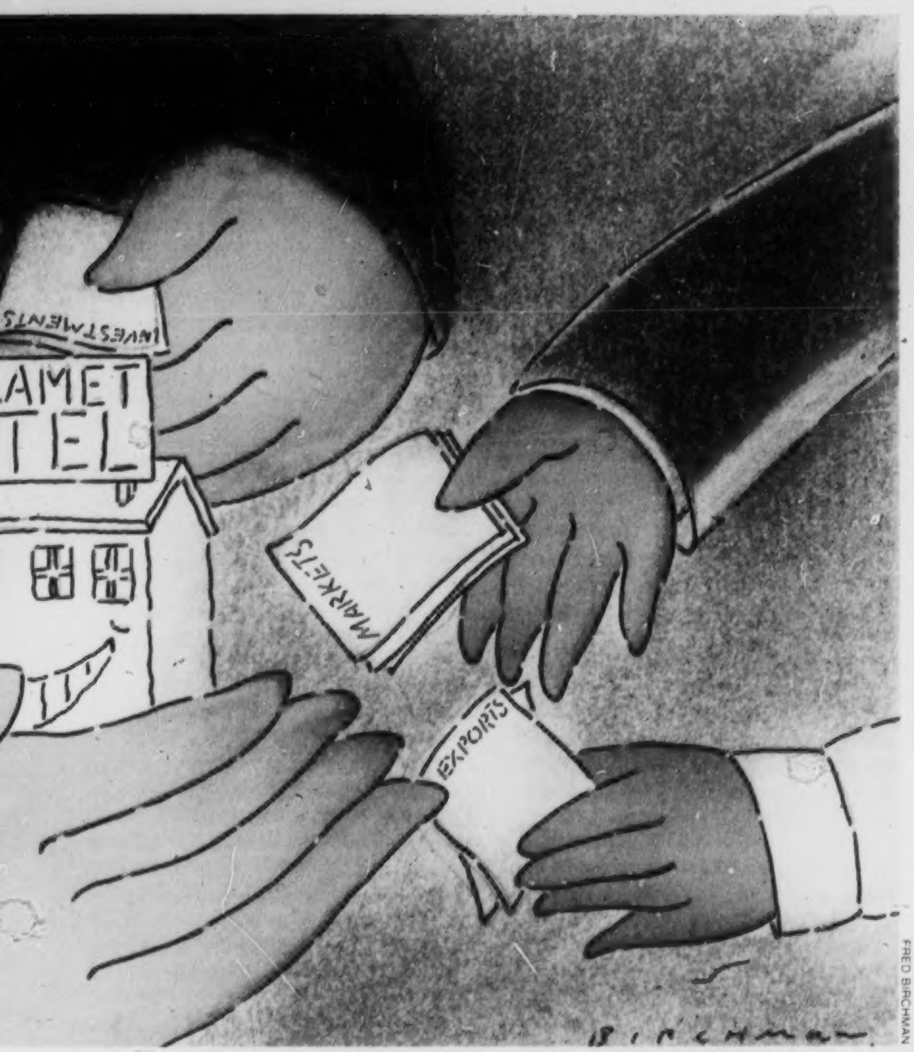
Now the old hotel is being looked at again. "We need something to revitalize the community," said Paul Scott, the executive director of the Lower Columbia Economic Development Council. "We hope that the renovated hotel, as either a bed and breakfast or a miniconvention center, will build up tourist trade and provide that shot in the arm." Scott called the Department of Community Development, the state agency that oversees the Community Revitalization Teams (CRTs). "With very limited resources in the county, we were without the necessary help," he explained. "I asked for the involvement of Washington ambassadors with skills in hotel management, architecture, and interior design."

Four ambassadors and a CRT representative met for a day with eight public and private sector members of the Lower Columbia Economic Development Council. Together they wrote a feasibility study, completed in December 1986, on the hotel utilization possibilities, operating costs, renovation needs, and tourist potential. The study will be used to entice and inform potential investors in the hotel. The ambassadors will remain involved on a continuing basis to review the study and suggest possible revisions based on the response from investors. "The ambassadors met our requirements to a tee," said Scott. "For the community, it was a very excellent program."

Washington ambassadors are business people from all types of private businesses throughout the state who volunteer their expertise and experience for the economic development of Washington as a whole. Ambassadors form one arm of Team Washington, which, in turn, is a component of Governor Booth Gardner's economic development plan called "The Washington Plan." Team Washington—composed of the Washington Ambassador Program, Associate Development Organizations, and Community Revitalization Teams (see chart on page 22)—offers small communities like Cathlamet, as well as countries such as Korea or Japan, a well integrated route into the economic structure of Washington.

The Economic Development Partnership for Washington, a private, nonprofit, membership organization, plays a role in Team Washington by acting as a liaison between the public and private worlds. The Washington Ambassador Program, as a direct effort to address and deepen the relationship between the public and private sectors, is organized and administered by the Partnership.

One of the central features of Team Washington is the creation of mechanisms that allow branches of the Washington economic infrastructure to communicate more effectively. For example, there are now thirty-three Associate Development Organizations (ADOs) throughout the state. "ADOs are new umbrella groups that are able to give profiles of counties and towns, and



FRED BIRCHMAN

onomic Development

create inventories of industries and needs," explained Jerry Ellis of the Department of Trade and Economic Development. "They exist to acknowledge the different and specific needs of each local area."

ADOs are designated by the state and can be existing economic development offices or other county organizations. They receive $25,000 in matching funds from the state to keep track of economic factors. Often it is the director of an ADO who will call up the Partnership to request an ambassador's expertise. ADO members also team up with ambassadors on domestic and foreign trade missions. The ADO representative knows his or her area's needs, whereas the ambassador can provide the business expertise and the skills needed to make important contacts or broach difficult subjects. The Community Revitalization Teams, directed by Meg Block through the Department of Community Development, are designed to work with the ADOs. A CRT can troubleshoot for a community as when, for example, one helped Cathlamet find ambassadors to work on the hotel study.

Learning the Ropes

The goal of the ambassador program is to provide business people with the knowledge of how to use various state agencies as they work with companies or countries. The two-day ambassador training program is the initial step in acquiring this expertise. Approximately 150 business people from across the state have attended the two training sessions, the first in 1985 and the second in July 1986. Their businesses ranged from giant communications companies to agricultural and shipping companies, investment firms, banks, and computer software designers. Companies were recruited to participate to achieve a balance of large and small firms, types of industries, and areas of the state. Also, some companies asked to participate.

On the first day of training, representatives from the State Department of Trade and Economic Development, the Department of Agriculture, and the Department of Employment Security explained ways in which their departments were involved with Team Washington and how they worked with ambassadors and the private sector. The presentations emphasized the necessary and integral relationship between private business and government in economic development. The focus telescoped from the smallest of distressed counties (in Washington there are twenty-two out of thirty-nine) to the luring in of big business from the Far East.

When the Washington Ambassador Program began in January 1985, its initial purpose was to provide an ongoing connection between Washington and business possibilities in foreign markets and other states. It was thought that ambassadors, during their own business trips and on specially planned trade missions, would collect information on businesses planning to expand or move, make contacts for the state, and generally pitch Washington to other states and foreign markets. It has since become apparent, however, that ambassadors could provide a valuable service by offering their expertise to the grass roots efforts of communities within the state. The program has, therefore, changed considerably since its inception. It now focuses almost equal attention on developing local industry and business as on trade missions outside the state.

Along with this growth in the program, ambassadors now participate by working within one of the following five distinct "tracks":

- *corporate executive officers* participate in very high-level meetings and close deals for the state;
- *traveling representatives* regularly travel to domestic and foreign markets for their own business and are able to make contacts and gather information for Washington development in general;
- *mission representatives* participate in specially designed domestic or foreign marketing and trade missions, providing expertise and contacts for government staff people;

- *community assistance representatives* provide support to grass roots efforts for development in communities throughout the state;
- and *technical advisory representatives*, familiar with major trends in their industries, provide specific technical expertise to other branches of the development network.

The training sessions were designed to show the fledgling ambassadors, through case studies, the sorts of issues and questions they would face in whatever "track" they decided to work.

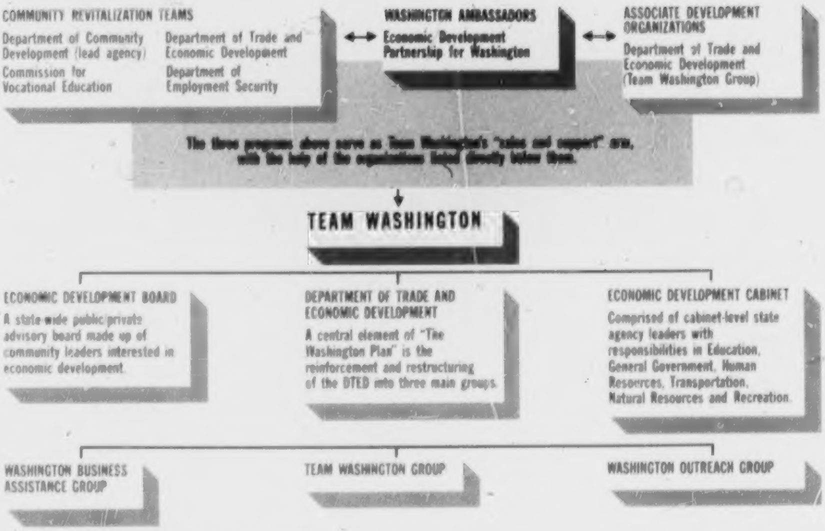
Soon after last July's training session, Russ Riggins of Peat-Marwick had a chance to test his working knowledge of the complexities of the government agencies. One of his clients, a Washington firm, was bidding on a contract for between $15 and $20 million worth of telecommunications equipment for Indonesia. If this installation worked well, there would be a follow-up contract of equal value available to that firm. The company's main competitor was a firm in Finland that was offering Indonesia a very attractive, long-term, export financing package. Riggins called the Partnership to find out how he could act as a liaison between the firm and Washington state to investigate all of the potential export financing plans so that the Washington business could bid more competitively and land the contract. The Partnership's role in this instance was to locate people from appropriate government offices, including the Indochina trade specialist from the Department of Trade and Economic Development, and have them get in touch with both Riggins and the firm.

The Trade Missions

The trade missions, the most public work in which the ambassadors are involved, can be domestic (to other states) as well as foreign. Most often the focus of the missions has been broad, not only presenting Washington as a good place to locate business but also as a good jumping off point to the rest of the United States or Asia.

Don Lorentz, of the Department of Trade and Economic Development, stressed that along with a new perspective on the unified development of Washington's economy, Team Washington and the Washington Ambassador Program specifically must begin thinking of Washington as a facilitator of trade, not just as a source that either buys or sells goods. "Washington, as the primary link to the Pacific Rim and the northern tier states, is important to the Far East Asian market," said Lorentz. He also feels that the ambassadors are essential to getting Washington trade possibilities out into the world. "It seems European countries are interested in Washington, too, as a link to Asia and as a pivotal point for reaching the rest of the western states," he added.

The Team Washington Players


COMMUNITY REVITALIZATION TEAMS
Department of Community Development (lead agency)
Commission for Vocational Education
Department of Trade and Economic Development
Department of Employment Security
WASHINGTON AMBASSADORS
Economic Development Partnership for Washington
ASSOCIATE DEVELOPMENT ORGANIZATIONS
Department of Trade and Economic Development (Team Washington Group)
The three programs above serve as Team Washington's "sales and support" arm, with the help of the organizations listed directly below them.
TEAM WASHINGTON
ECONOMIC DEVELOPMENT BOARD
A state-wide public/private advisory board made up of community leaders interested in economic development.
DEPARTMENT OF TRADE AND ECONOMIC DEVELOPMENT
A central element of "The Washington Plan" is the reinforcement and restructuring of the DTED into three main groups.
ECONOMIC DEVELOPMENT CABINET
Comprised of cabinet-level state agency leaders with responsibilities in Education, General Government, Human Resources, Transportation, Natural Resources and Recreation.
WASHINGTON BUSINESS ASSISTANCE GROUP
TEAM WASHINGTON GROUP
WASHINGTON OUTREACH GROUP

SOURCE: The Economic Development Partnership for Washington

Ambassadors invited, or who volunteer, to go on missions pay their own way. Also, in conjunction with the Partnership, they pay for aspects of the trip that the state is not allowed to pay for such as gifts.

Victor Ericson, the economic development director for Pacific Northwest Bell in Washington, participated in the 1985 ambassador training program. In February 1986, he went on the first domestic trade mission, which was to southern California. The mission, composed of members of ADOs from all over Washington, Department of Trade and Economic Development people, and ambassadors, was given mixed reviews. The initial goal, according to Ericson, was to establish contacts with a number of companies in many different industries and to encourage them to consider Washington if and when they wanted to expand or move. This goal proved to be too vague.

"The one problem I found with the mission, from the point of view of a business representative in the role of an ambassador, was that there wasn't enough preparation for the ambassadors," said Ericson. "ADO people knew basically what they wanted to accomplish, but it was unclear how we could best assist them. What was most interesting was to see the response of the people in southern California to state and local government representatives and business people all sitting down together and saying 'we're united in the economic development process'," said Ericson. Most did not expect to see the normal adversary relationship between public and private sectors resolved in such a way.

According to both Ericson and Bill Grinstein, director of the Partnership, the most valuable lesson from that first trip was the need for a great deal of planning and pre-mission research. "In one meeting it is very difficult to approach a subject such as a business expansion or a move," said Ericson, who is willing to participate in another mission. "Nobody, I think, came away with a firm commitment from anybody, but that's the kind of groundbreaking that you need, and a lot of follow-up opportunities came of it," he added. He also noted that preliminary work would allow for a honing down of a prospect list. Grinstein candidly described the mission as a positioning effort and learning experience for the ambassadors and the ADOs, implying that little was achieved in terms of business development. "It was very worthwhile on-the-job training," said Grinstein.

With regard to the developing relationship between government staff people and private business, however, the southern California mission seems to have been a success, spawning new ways of cooperation. For example, some of the ambassadors developed a training class on how to make a sales call, what questions to ask, how to learn important information, and how to close a sale. They presented the class at a conference held for ADOs and the skills learned have been put to use in subsequent missions.

In the fall of 1986, two more missions took place; one group of about fifty-five people went to Japan, Korea, and Taiwan for sixteen days, and the other group went to Europe. Both missions included twenty to twenty-five ambassadors.

Ambassadors found the Asia mission, on the whole, to be well planned and useful. Wayne Erickson, chairman of the Washington Software Board and chairman of the board and founder of Microrim, a computer software company in Redmond, Washington, went on the Japan and Taiwan legs of the trip. Working both for the state and as a representative of Microrim, Erickson found the trip useful: "It was necessary as a fact-finding mission. The state needed to learn about the opportunities for software companies in the Far East; I wanted the same information for my company, specifically in Taiwan." What he learned had both negative and positive sides. "In Taiwan there is no enforcement of intellectual copyright laws. Software is copied and then sold for very little so there is really no market there for Washington companies. I did, however, find interest on the part of Taiwan in the start-up possibilities in Washington," he explained.

Erickson, who said he would like to participate in other ambassador missions, thought this one was well organized and productive. Meetings had been set up in advance and people knew whom they wanted to talk to, but there were some problems. "There was some confusion about who was in charge," said Erickson. "The Department of Trade and Economic Development handled some aspects and the Department of Agriculture handled other facets. Occasionally, they appeared to vie for leadership." He added, "I also felt some frustration, as someone in business, over the pacing. It may be a difference between private enterprise and government, but I think more work could have been done in fewer days."

Bob Baskerville, an attorney with the Seattle firm Davis, Wright, and Jones attended the Korean section of the mission. He, too, was able to combine his own business with work for the state. One of the important aspects of the mission was the effort by the organizers to give all the general presentations in the native language. Baskerville, who learned Korean in the Peace Corps, spoke on the need to develop long-term economic relationships with Korea. In two-way trade with Washington, Korea ranks third; however, long-term development such as joint ventures has not been explored as it has with countries such as Japan. Also, Korea is a fairly unknown quantity to Washington. Likewise, Koreans are unfamiliar with Washington. "I felt that the work to introduce Washington to Korea was done particularly well," said Baskerville. "It was very effective to have Korean nationals working for Washington companies talk to the Korean companies about the state and its economic potential."

Although Baskerville felt he did not have enough opportunity to talk with others on the mission and so get an overall feel for its direction, he was impressed with it and felt such trips took the beginning steps. "They are useful as long as there is a lot of follow-up," he explained. "A one-shot deal will have little benefit since Washington is just one of many states that will visit Korea. A long-term vision over the range of ways we can be involved must be developed for these efforts to be useful."

Statewide Projects

The ambassadors are also involved in a number of statewide projects that are somewhat more general than trade missions or community redevelopment assistance. For example, the Community Revitalization Teams have financed a resource guide for people involved in homebased industries—traditional crafts and agriculture businesses that have now expanded to include nontraditional industries such as computer software. These small industries, which have proven to be a definite addition to the employment base in most communities, need access to the public sector network. With the help of ambassadors, this "Living Resources Guide" will aid them in identifying whom they need to talk to in government. Ambassadors, along with CRTs, the Small Business Development Corporation, Small Business Development Loan Fund, The Partnership for Rural Improvement, and Washington State Community Colleges, are working together to develop an umbrella organization that will support homebased industries and be complemented by the resource guide. Another focus on homebased industries involves surveying counties to obtain an accurate picture of the varieties and numbers of these small businesses. Ambassadors are involved here in developing the survey and interpreting the results.

The Partnership is also in the process of compiling a database on ambassadors. This would not only contain updated information on the expertise of the volunteers, but would be able to tie in to existing databases that supply the vast array of economic development information. "A steady and useful flow of information between all the branches of Team Washington is the goal," said Bob Bell, who directs the Washington Ambassador Program for the Partnership. "The interaction of people is the key to economic development. That is the most important link, but it is also essential to make more accessible information that is available but not often used."

A sidelight to the development of the Washington Ambassador Program is its tie to the current leadership of the state. Although the Partnership and the ambassador program are not dependent on government funding, hence not actually at the mercy of the philosophies of whoever fills the governor's role, it is true that Team Washington is Governor Gardner's creation. Just as he reorganized certain departments to more accurately reflect the concept of Team Washington, it is possible that the Washington Ambassador Program could be left sitting high and dry if political priorities were to change.

None of the programs that involve or rely on the work of ambassadors is fully completed. It is not yet clear that Cathlamet's feasibility study will successfully attract an investor in the hotel. Still, the ambassadors provided the community with a service that would have been quite costly had the community hired consultants. Clearly a key element in determining the success of the ambassador program, and the missions for that matter, is the follow-up provided. One-time visits to countries, one meeting with a business, or one involvement with a community will not be enough to ensure any sort of development.

It seems that the Washington Ambassador Program has begun to pick up steam. Ideas for exploiting its full potential, however, are only now being realized. As Bell suggests, "Economic development is a slow process. The Washington Ambassador Program with Team Washington will provide businesses and communities with access to a broader base of public and private support." The Washington Ambassador Program, as it grows, may provide the bridge that can effectively tie the public service with private enterprise. It is an ambitious project.

Laura Brenner is a freelance writer based in Seattle.

Export Trading Companies and Public Ports:

A New Initiative in Washington

by Jerry W. Ralston

Port districts in Washington state may now establish export trading companies as the result of a bill signed into law by Governor Booth Gardner on April 3, 1986. In simple terms, an export trading company (ETC) is a facilitator in international trade. An individual, company, or corporation acts as a middleman between, for example, a U.S. supplier and a purchaser located abroad. An ETC is differentiated from brokers, agents, export management companies, and commission houses in that its business practices involve buying and selling as opposed to providing services and expertise for a fee.

The concept of an ETC is not new. Japan, the Netherlands, and Great Britain have used ETCs very successfully, in some cases for centuries. A large number of U.S. export trading companies have also been in operation for decades. For the most part, however, these U.S. companies are small, have a limited scope of activity, and normally deal either in a very narrow product range or geographic area or both.

The declining position of the United States in world trade, evident by the early eighties, stimulated Congress to pass the Export Trading Company Act of 1982. Encouraging the establishment of larger, more capable export intermediaries for U.S. goods and services was seen as a way to increase markets for U.S. firms and jobs for U.S. workers. This federal Act permits banks and certain other financial institutions to invest and actively participate in ETCs. It also clarifies the antitrust laws relating to foreign trade and devises a certification process so that collective efforts can be made in accordance with those laws. In addition to financial institutions, businesses and organizations, both public and private, can play an important role in ETC development. Port authorities were specifically cited as potential sponsors or partners.

The U.S. Department of Commerce is the lead agency responsible for implementing the federal ETC Act. By the end of 1986 it had issued some seventy certificates of review, providing antitrust protection for about three hundred companies and individuals, many grouped together in joint-venture or consortium arrangements. Small and medium-sized firms constitute the majority of the holders of certificates. Over forty ETCs have been established by financial institutions, with a total authorized investment of about $84 million ranging from a high of $18 million to a low of $10,000.

A 1986 U.S. General Accounting Office (GAO) survey, which included twenty-three ETCs with certificates of review, stated that many ETCs had not done as well as they had hoped. The GAO concluded that "thus far, the exports facilitated by ETCs have not been significant." However, it also stated that bankers and exporters are gaining an increased awareness of export trading and may well be in a position to take greater advantage of export opportunities when economic conditions become more favorable.

The external economic environment has shown substantial improvement in 1986, with lower interest rates, lower ocean freight rates, and a lower value for the U.S. dollar. Given the extent of interest in exporting at the national level, it would seem that Washington state's new legislation may have the advantage of good timing.

A Needed Vehicle

Many reasons underlie the U.S. trade problem, not least of which are the risks, uncertainties, and barriers that businesses encounter in foreign markets. These obstacles make it difficult for other than the largest companies to compete effectively abroad. Indeed, only about 10 percent of U.S. manufacturing concerns export at all. U.S. firms are also facing increasingly tougher competition from foreign firms, both at home and abroad, as the manufacturing sectors of developing countries expand their capabilities.

Although many small and medium-sized businesses are effectively frozen out of foreign markets, the greatest potential for enhancing U.S. exports rests with these firms. According to various estimates by U.S. government agencies, twenty to forty thousand such enterprises could be exporting but are not currently doing so. ETCs are seen as a vehicle for helping these firms realize their export potential.

Information on exporting is not lacking. More than fifty entities in Washington state are engaged in promoting international trade through offerings of almost every conceivable service. These include federal, state, and local government agencies, banks, industry and trade associations, nonprofit organizations, and port authorities. Through their trade development activities, ports have been directing their efforts toward trade expansion for years.

What the average potential exporter needs is something that no existing agency in the public sector can provide and that most existing intermediaries in the private sector are unwilling to supply. The missing ingredient has been the ability of an export promotion and development agency to go beyond providing information and actually cause a firm's merchandise to move into international trade by buying and reselling the products (taking title), thus removing the risk of exposure to foreign collections while also performing the sometimes complex requirements of an international trade transaction. Under the new Washington state ETC law, port authorities can now perform this needed function.

Port Authority ETCs

Most port authorities currently provide only a limited range of terminal and related services such as wharfage, warehousing, consolidation, and stevedoring. Since a port stands in the center of the exporting chain, is familiar with the exporting process, and has contacts with both domestic shippers and overseas purchasers, it can do more. In fact, most ports have objectives in their charters that go beyond simply serving the public as terminal operators.

As a public entity, a port has an interest not only in increasing its own traffic, but also in increasing regional exports. Its perspective goes beyond simply maximizing shareholder's equity or profits; it can also serve an economic development function aimed at increasing jobs and overall regional economic growth. Trading is a natural way for ports to improve their services to shippers while stimulating both local economies and their own throughput of cargo.

Historically, it has been difficult to organize small-scale business and agricultural interests to work together in any meaningful kind of export marketing or sales activity. As the place where these goods come together, ports could play a key role in stimulating such exports from their regions. The port might serve as an impartial member of such an industry group, a role permitted by the federal ETC Act.

Ports can provide an incremental improvement to U.S. exports by filling gaps left by the private sector in terms of services offered and firms serviced. For example, there are some six hundred thousand new firms created every year in the United States, but private sector ETCs tend to solicit customers who are more well-established and with proven product lines. By working with new companies, a port could generate new export business, not merely compete with private sector ETCs for existing accounts.

During and immediately after passage of the federal ETC Act, many state and local governments, port districts, and other nonprofit associations displayed considerable interest in developing a new role for themselves as export trading companies. Although much of this interest has subsequently cooled, some public entities have proceeded to form ETCs, and some states have taken legislative action to permit such initiatives. Two port authorities have operating ETCs: VEXTRAC in Virginia, and XPORT at the port of New York/New Jersey. The port of Philadelphia is proceeding to formalize a similar operation, and the ports of Mobile, Los Angeles/Long Beach, and Boston are in various stages of developing ETCs. Oregon has passed enabling legislation, but no Oregon ports have as yet taken action.

Some port authorities have not taken advantage of the ETC Act because they are unaware of how the Act operates. According to one survey, some port authorities believe that the Act requires affiliation with a bank, a step cited as unnecessary or undesirable. Some are also uncertain as to the activities in which they would be permitted to engage, are concerned that some export activities are too far removed from their traditional areas of expertise, and that they may overstep their legal authority. The Washington state legislation now clarifies such issues.

A 1983 survey in Washington state concerning the establishment of ETCs by state port authorities involved 240 firms already engaged in exporting. The port ETC was generally seen as a viable vehicle for promoting exports from the region. Marketing was seen as the most valuable service a port ETC could offer, followed by consulting, financing, market research, and taking title to merchandise.

Public vs. Private

Many of the objections to public port involvement in ETC development derive from a philosophical opposition to participation in the private marketplace by any public entity. However, this opposition should not be permitted to prevent public action where study and good judgment reveal that the private market has not performed effectively. The Department of Commerce has consistently taken the position that a port authority's program should complement the private sector's efforts, and has urged potential port ETCs primarily to fill the gaps that exist in the export stream.

In areas where the private sector is doing a good job, the public sector should not initiate tax-supported competition. Washington state legislation clearly addresses this issue by stating that the intent is to increase export trade and not create competition for existing businesses. Activities engaged in or pursued by a port ETC must also be "charged for in accordance with customs of the trade at competitive market rates."

The Washington Act permits a port ETC to provide services such as international market research, promotion, consulting, marketing, legal assistance, trade documentation, financing, and communication and processing of foreign orders to and for exporters and foreign purchasers. Contracting or arranging for transportation, insurance, warehousing, foreign exchange, and freight forwarding is also permitted. Port ETCs may also hold and dispose of goods in international trade and take title to goods. However, they may not own or operate directly or indirectly any business that provides freight forwarding, insurance, foreign exchange, or warehousing services, and they may not engage in the business of transporting commodities by motor vehicle, barge, ship, or rail for compensation.

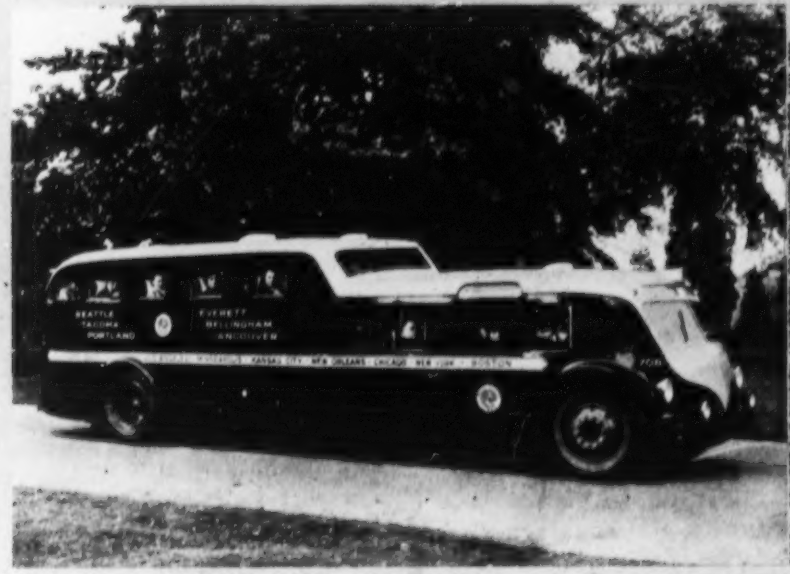
The Washington legislature also concluded that significant public benefit in the form of increased employment and taxes could be achieved through ETCs without lending public credit or capital investment of public funds. To promote and establish ETCs, however, port district funds can be used up to the limits of $500,000 and five years. The Act specifically states that obligations of a port ETC shall not in any manner be obligations of a port district nor a charge upon any revenues or property of the port district. In addition, an ETC has no power to issue general obligation bonds, levy taxes, or exercise power of eminent domain.

This new initiative in Washington state came not without controversy. Opposition, centered within the central Puget Sound area, caused a provision to be included that prohibits the state's two largest ports, Seattle and Tacoma, from forming ETCs. However, the Port of Bellingham has done some preliminary planning and several other Washington ports are currently evaluating the opportunity presented by the new law. It is likely that some action will be taken during 1987.

Indications are that port planning and business plans for ETCs (required by legislation to be presented for public hearing) will focus on firms new to the market, on products from Washington state, and on providing assistance to companies in the service sector for which overseas opportunities exist. Although ETCs are not a panacea appropriate for each of the state's fifty-nine port districts, they are highly flexible entities that can be customized to the needs, budget, and philosophy of any one port, its clientele, and the economic development of its local community.

Jerry Ralston is a Seattle-based consultant on international trade and business operations and strategy, countertrade, and export trading companies.

Gallery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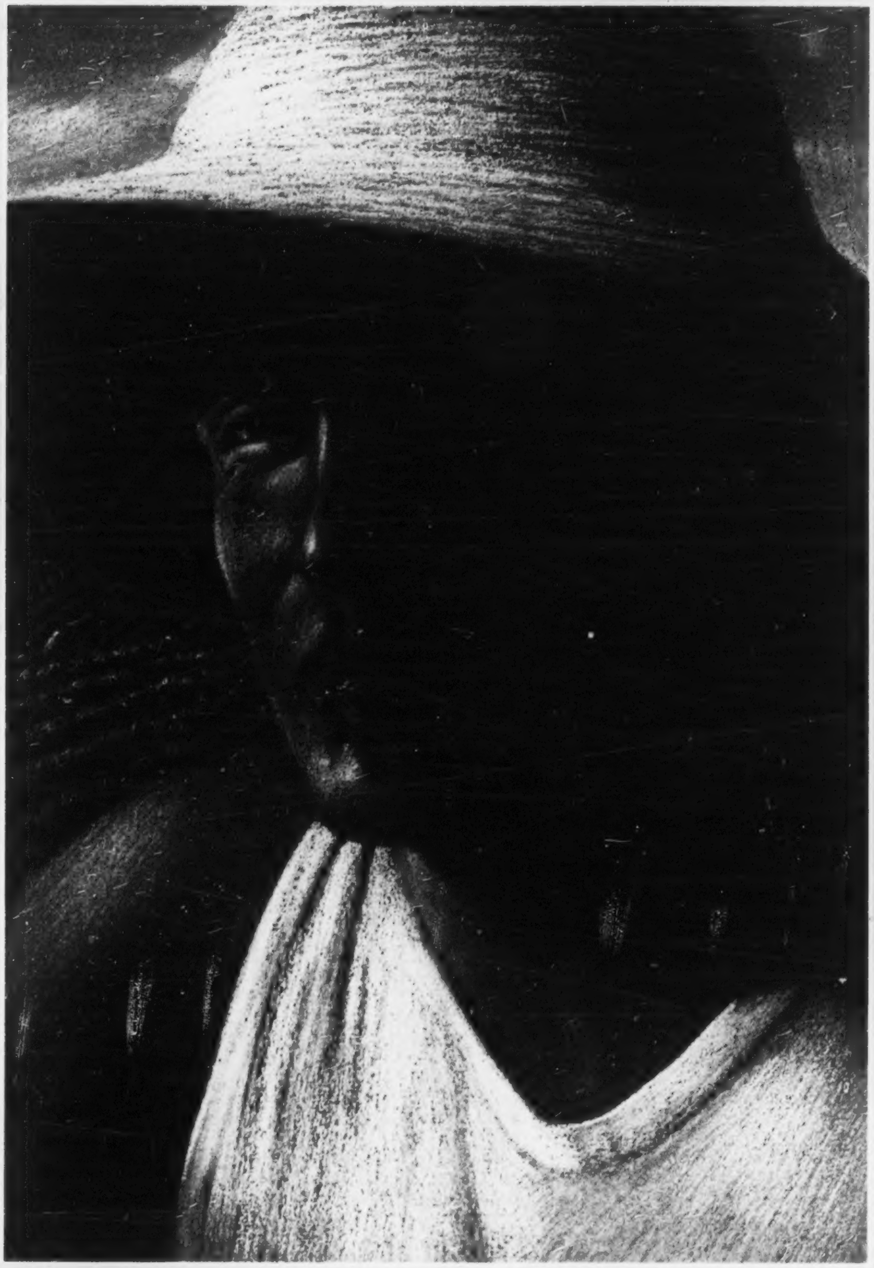
PACIFIC NORTHWEST Executive



Commentary

After a lengthy and controversial journey through the federal legislative process, the Immigration Reform and Control Act of 1986 (IRCA), which coupled strong employer sanctions with a liberal amnesty program, was signed into law on November 6, 1986. Senator Alan Simpson and Representative Romano Mazzoli had argued that immigration reform was necessary if the country was to regain control of its borders.

Will illegal aliens stop crossing our southern border in search of jobs, or will they keep coming with the expectation that forged identification cards will be easily available and sufficient to get them into our work stream? How many undocumented workers actually reside in the Pacific Northwest? Of this number, how many will come forward to apply under the provisions of the amnesty program? No one knows the answers to those questions.

Aside from amnesty, the other great force in the new legislation is employer sanctions. For the first time, employers will have to check the legal status of those they intend to hire. Sanctions for knowingly hiring an illegal alien are stiff, and, in my opinion, no one yet understands the scope and magnitude of the responsibility now imposed on all employers. The new antidiscrimination provisions of the IRCA will further complicate the employer's world.

Precise figures on harvest labor are impossible to obtain. I would estimate, however, that more than 50 percent of the harvest labor for last year's apple crop in Washington was supplied by undocumented workers. In the fall of 1986, workers harvested enough fruit to send more than 50 million cartons of fresh apples to markets throughout the world.

Production in our industry is increasing. Our growers will be forced to use existing legal labor supplies more efficiently, explore mechanization, and recruit domestic workers from outside the region to meet our labor requirements in the years ahead. I do not think, however, that we will obtain enough help from U.S. citizens or legal aliens to do the job. The number of people willing to do migrant labor at a wage scale that will allow growers to be competitive in a world market is limited.

Should a shortage of labor befall growers, the IRCA provides a replenishment agricultural worker program, and attempts will certainly be made to use this program, or, as a last resort, the more complicated H-2 program. Both options give growers a means to import foreign labor should a shortage of U.S. workers develop. Somehow, we will get our crops harvested.

The Immigration Reform and Control Act of 1986 is one of the major pieces of legislation of the past two decades. Only time will tell if it proves to be a success, a failure, or, more likely, a mix of the two.

Christian E. Schlect
President
Northwest Horticultural Council
Yakima, WA

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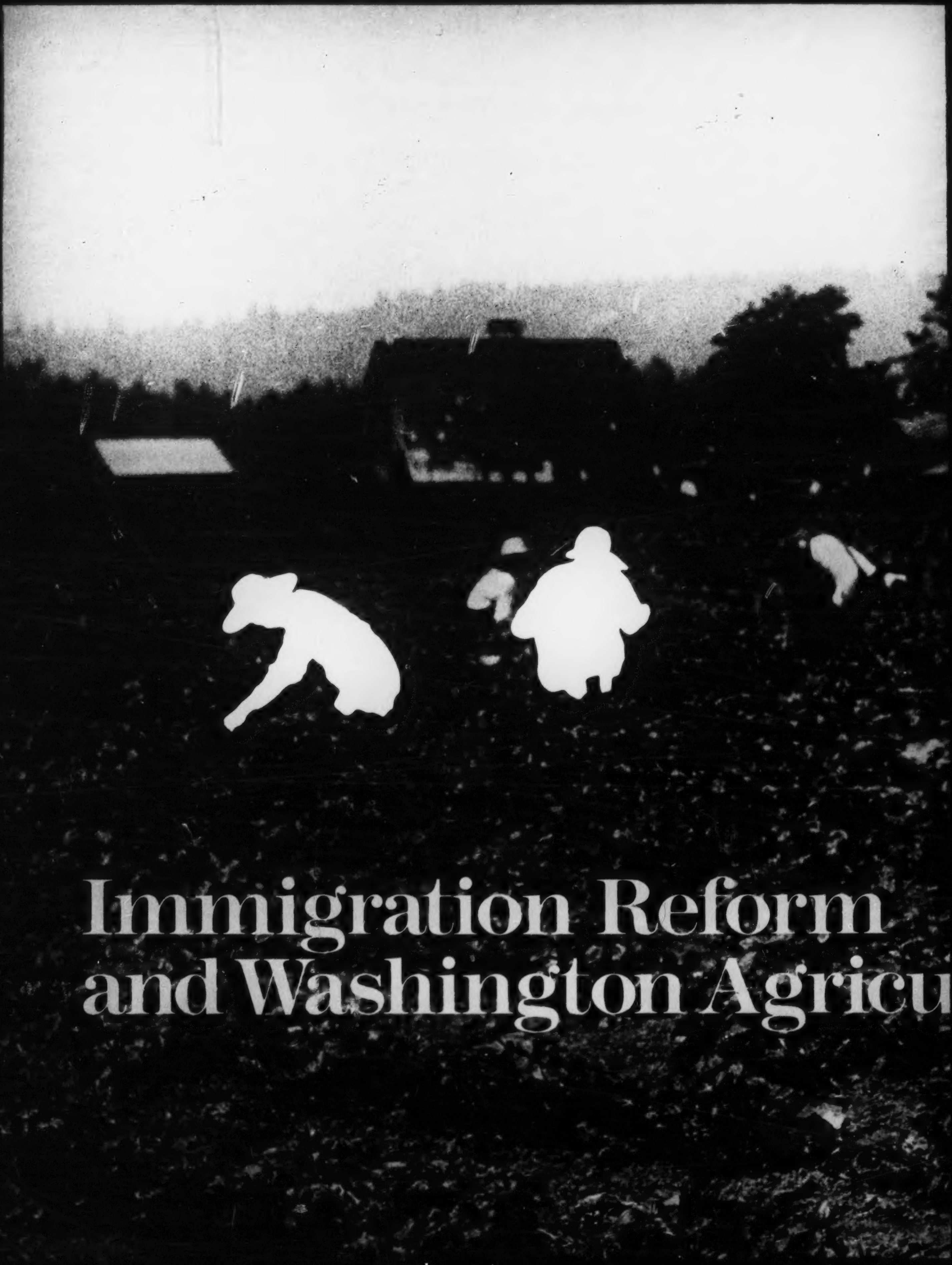

Immigration Reform and Washington Agricu

ture

fellow INS officers are out in the van lacing up their running shoes for a footrace with eight of Elder's workers.

Nevertheless, Elder and Harden talk about the weather and the latest goings-on at the local tavern, which attracts migrant workers and their newfound cash. As Elder pours the coffee, he suspects that most of his illegal alien workers have made it to the banks of the slow-moving Skagit River and that, after a morning swim, they will be back at work. The ones that do not make it will be put in Harden's van and bused or flown back to Mexico. They, too, will be back, but probably not for four or five days.

The scene is a common one in the berry and vegetable fields of western Washington and in the fruit orchards of eastern Washington. Immigrants fill virtually all of the 280,000 manual agricultural jobs in this state, and immigration experts and farmers estimate that, on the average, 50 to 60 percent of them are here illegally—although the estimates range from a low of 20 percent to a high of 90 percent. Critics of the use of migrant and alien laborers feel that illegal aliens impose an undue burden on school systems, cause a drain on social programs, and take jobs away from U.S. citizens. Growers argue that local white workers could not do these jobs as efficiently as the immigrants and definitely not as cheaply. To appease both groups, Senate Bill 1200 was written, (and, over the course of five years, debated, rewritten, and revised), approved by Congress, and signed into law by President Reagan on November 6, 1986.

Current State of Affairs

"Give me your tired, your poor" has turned into "give me your families, your skilled laborers." With nearly two million applications for permanent visas backlogged at U.S. consular posts, the only hope that a prospective immigrant has of reaching "the land of opportunity" is a family that is already here or a professional skill. The 270,000-person immigration ceiling, in effect since October 1, 1977, is apparently arbitrary and is not based on desired U.S. growth rates, domestic needs, or absorptive capacities. Regardless of the objectives, the ceiling is nowhere near the estimated one million legal and illegal immigrants who enter the United States every year.

Migrant workers begin leaving Mexico and Texas in April for the early asparagus harvest in eastern Washington. Even more come in June, to work the berry fields of Skagit and Whatcom counties. By late June, about one in 10 people in Washington State is not a U.S. citizen. As the summer progresses, so does the work, from cucumbers to broccoli to cauliflower. Migrants work in teams of 15 to 30, and, although they are paid individually, their work is measured, piece rate, by team. They police themselves, firing workers who cannot keep up and replacing them with ones who can.

Wage rates are set informally (and illegally) by the growers, who hold periodic meetings. The rates are sensitive, however, to the supply of labor, and strikes are not uncommon. Given the piece-rate pay system, poor crops mean small paychecks for workers, who will sit down in the fields until farmers call emergency meetings and agree upon a higher pay rate. The numbers of aliens available for work has been growing, but so has the demand. To attract workers, farmers have gradually provided more comforts, such as rain gear and boots, and more benefits, such as 50 percent housing sub-

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A Summary of the New Immigration Law

Employer Provisions

Sanctions. Employers will be required to verify a worker's status by inspecting citizenship papers, such as a U.S. passport, a U.S. birth certificate, a resident alien card, or a U.S. driver's license, and they must attest in writing to having seen the identification. It will be unlawful to hire knowingly any aliens not authorized to work in the United States.

Penalty Structure. Employers and recruiters will be required to keep records of documents, subject to fines of up to $1,000 per employee for failure to do so. Furthermore, these documents must be kept up to one year after an employee leaves the employer's service. Should a "pattern or practice" of hiring illegal aliens be established, penalties of up to six months imprisonment or a $3,000 fine will be imposed. Fines are as follows:

- First offense—a civil fine from $250 to $2,000 per illegal alien hired.
- Second offense—a civil fine from $2,000 to $5,000 per illegal alien hired.
- Third offense—a civil fine from $3,000 to $10,000 per illegal alien hired.

Discrimination. The new law goes beyond Title IV by making it illegal to discriminate on the basis of national origin, or, for the first time, on the basis of *citizenship status.* (In addition, a recent federal court ruling held that undocumented workers cannot be fired from their jobs solely because they obtained work—prior to November 6, 1986—by using false Social Security numbers. This ruling effectively states that an employer cannot fire an employee for questionable citizenship status.) Farmers convicted of discrimination will have to rehire those injured, pay a civil fine of up to $2,000, and pay back wages.

Enforcement Timetable. From November 7, 1986 through May 5, 1987, there was an education period during which employers were not subject to penalties. From May 6, 1987 through May 5, 1988, violators will be issued warnings for the first offense. In addition to this basic timetable, employers involved in field work lobbied for and were given a special concession: a two-year deferment from November 1986 to November 1988. In order to bring a case against employers, a judge must be presented with a "preponderance of evidence." Employers may then defend themselves by showing that they complied in "good faith" with the verification procedures. Should Congress and the Comptroller General conclude, after November 7, 1989, that the sanctions result in discrimination in employment, the sanctions will be terminated.

Worker Provisions

Temporary (H-2) Workers. Employers must apply to the Secretary of Labor no more than 60 days in advance of needing temporary (H-2) workers. These workers must be guaranteed employee benefits, such as worker compensation and travel and living costs, and will be provided assistance in wage and working condition suits by the federally funded Legal Services Corporation.

Seasonal Agricultural Workers (SAWs). Temporary resident status will be granted to up to 350,000 alien seasonal agricultural workers (SAWs), if they can prove residence in the United States for at least three years. Those who can prove they worked in agriculture at least 90 days between May 1985 and May 1986 will also be given temporary status but will receive no welfare benefits. Replenishment farm workers will enter the United States as temporary workers to replace workers who leave, but will not be eligible for most public aid.

sidies that include water and electricity. A worker's annual income ranges from $7,000 to $12,000. Often much of it is mailed back to families in Mexico, making U.S. employment, next to tourism, the second largest contributor to Mexico's GNP.

Accurate statistics are not available for the number of migrant workers or their legal status, but 1978 estimates—used to appropriate federal funds for legal services to aliens in Washington—were 80,000 migrant and 200,000 seasonal workers. Migrant workers have no permanent Washington residence, whereas seasonal workers live in Washington year-round. Note that these estimates are nine years old. The estimated number of immigrants from Mexico to the United States as a whole has grown exponentially during the last five years and is expected to increase 40 percent in 1987.

The immigration situation as it stands seems to be providing the state's agricultural industry with a labor supply that barely allows it to fend off foreign competition. Farms in Central and South America are producing fruits and vegetables that compete successfully against domestic products. The farming industry's lobbying efforts recognize the threat of foreign producers. This bill—a jolt to the labor supply, which constitutes 33 percent of the farmer's cost—could tip the balance in favor of foreign farmers, who not only have an abundant, inexpensive labor supply but also the luxury of little or no government regulation.

Why A New Law?

Past U.S. immigration laws have been highly ineffective. The U.S. Bureau of Census estimates that between 2.5 million and 3.5 million illegal aliens resided in the United States in 1980 and that at least 25,000 illegal aliens resided in Washington State. Considering the magnitude of these numbers, it is not surprising that the need to reform our immigration laws has been recognized and acted upon.

Immigration laws exist, first, as an attempt to protect the U.S. labor force. Many claim that the inexpensive foreign labor takes jobs from U.S. workers. Second, immigration laws reduce welfare demands, which can be large when one considers how many illegal aliens bring their families with them when they enter the states. They currently take advantage of welfare, food stamp programs, and free public education. Third, for reasons of public safety, it is desirable to keep foreign criminals out of our country. As an illustration of potential problems, INS agents estimate that one-half of all homicides and violent crimes in the Yakima Valley include illegal aliens, and most of the heroin in Washington is smuggled in by illegal aliens. Fourth, for health reasons, the laws attempt to protect the American public from transmittable diseases that cannot be controlled or monitored among the population of illegal aliens.

The major provisions of the new immigration law represent drastic and sweeping changes in our policies regarding illegal aliens in this country. A brief summary of those changes that will in various ways affect the hiring of illegal aliens in the United States is presented in the Summary of the New Immigration Law.

The Farmer's Options

In light of the current state of affairs and the provisions of the new law, the Washington farmer can choose one of three distinct options: comply fully with the law, make a token effort to comply, or not comply at all.

Option One: Comply with the Letter and Intent of the Law. When farmers consider hiring an illegal alien, they will be faced with a dilemma. On one hand, they risk losing highly perishable crops, such as strawberries, raspberries, and cauliflower, if they don't hire the illegal alien; on the other hand, they face economic sanctions and possible incarceration if they do. Some farmers will comply because they feel that the marginal gain from hiring illegal aliens is not worth the potential cost of having the INS shut them down.

If a farmer such as Burton Elder has hired up to 70 illegal aliens (as Elder has in the past), he would risk fines of $17,500 to $140,000 for the first offense and $140,000 to $350,000 for the second offense. If a "pattern or practice" of hiring illegal aliens can be established, the farmer faces additional fines and up to six months imprisonment.

One farmer interviewed claims that he intends to abide by the new immigration law. He plans to draft a document stating what the job will consist of and what the rate of pay will be, then institute a rule of "one job per one Social Security card." He also plans to hire additional staff to check each new hire's papers for authenticity and to ensure that the law's new record keeping requirements are met. He has also decided to stop paying workers in cash—even though that means that he'll have to start paying FICA, state unemployment taxes, and worker's compensation.

For many farmers, complying with the law will not be difficult. Since a large number of the workers will be eligible for some form of amnesty, farmers may continue to hire the same people but under a "legal" status. If a shortage of labor develops, under the temporary (H-2) workers program, farmers can apply to the Secretary of Labor 60 days in advance to recruit seasonal workers. Additionally, keeping the required paperwork can be seen as a benefit. The forms can serve as documentation for IRS audits or for employee-employer litigation. According to Rebecca Smith, an attorney with Evergreen Legal Services, these lawsuits occur frequently.

Richard Smith, the deputy district director of the INS, predicts that the vast majority of large farms and companies will comply because of their size and respect in the community. According to the Washington State Department of Agricultural Statistics, 6,170 large farms (with over $100,000 in sales) account for 85 percent of the food sold in Washington State. According to Smith, 96 percent of all employees work for companies with a hundred or more workers. "Large companies and farmers will not want the embarrassment of a lawsuit," said Smith.

Some farmers—trying to escape the law—believe that making the INS obtain a search warrant will protect them. According to Richard Smith, for every "survey" he has participated in, a warrant could have easily been obtained. In fact, the INS will have special lawyers to obtain warrants. All in all, many farmers, either because they are law-abiding citizens or because they fear both the fines and the jail time, will obey the law. What if they don't? Deputy District Director Smith says, "We will enforce the law!"

Option Two: Make a Token Effort. The new law states that the employer "fulfills his responsibility if he examines the documents, and each document reasonably appears on its face to be genuine." Many growers plan to check the IDs of workers, knowing full well that some may be false.

In a sense, the token effort could be thought of as complying with the letter of the law without trying to achieve the intent of the law, which is to eliminate illegal aliens from the U.S. work force. The token effort option is based on the philosophy that the responsibility for stopping these aliens rests with the INS, not the individual farmer. The farmer's responsibility is to grow and harvest crops in the most efficient and cost-effective way possible, not to achieve some national social goal. In order to compete in the national and world markets, the farmer must have a ready supply of experienced, inexpensive labor. Howard Trendle, an apple producer in the upper Yakima Valley, claims, "Without illegal aliens, the apples don't get picked." Farmers such as Trendle argue that the domestic labor force that the new law reputedly protects does not exist in the perishable agricultural-products industry.

The new law contains a number of provisions, such as the seasonal agricultural workers (SAWs) program and the temporary (H-2) workers program, designed to help farmers meet their labor needs. It also grants a grace period of education and reduced fines. However, a significant number of workers will not qualify for amnesty and will choose to falsify documents. Farmers who are already fighting hard to turn a profit will undoubtedly hire aliens who present reasonably good fake identifications.

Option Three: Total Noncompliance. The decision to not comply with the immigration law, a choice that entails no changes in current hiring practices, will be an informed one, since the volume of information distributed by trade organizations, the INS, and the media virtually guarantees that all parties concerned will be well versed in the specifics of the law. Noncompliance is an attractive option for a number of reasons:

- The supply of legal aliens will not satisfy the demand for labor in agriculture. If a farmer is faced with crops rotting on the ground, he will hire whoever is available.
- It will be difficult for growers to turn away illegal employees who have done a good job in past years.
- Growers who hire legal workers will be required to bear the cost of state unemployment taxes, FICA, and worker's compensation.
- Illegal aliens, due to the reduction in the number of jobs available to them, will probably be willing to work for less than their legalized counterparts and will not have the leverage of legal workers in labor negotiations.
- Farmers may feel that the law has no teeth and cannot be enforced. For instance, a search warrant is now required "for INS officers to enter outdoor agricultural operations to enforce immigration laws." Many farmers will continue to use tricks, such as roadblocks and phony Social Security cards, to evade INS officers, as in the past.
- Employer sanctions do not officially go into effect for field work until November 1988, thus eliminating some of the risks in hiring illegal aliens in the short term.

Noncompliance poses the risk of fines and possible imprisonment. However, past ineffectiveness by understaffed and underfunded INS officers, coupled with financial considerations, may encourage some farmers to chance the risks associated with noncompliance.

Labor Supply

The entire agricultural labor force in Washington is estimated at 280,000. Although the exact number of illegal aliens has not been determined, farmers' and immigration officers' best guesses (20-60 percent) are used as estimates. If these numbers approximate reality, 56,000 to 168,000 illegal aliens reside and work in Washington State alone. Some illegal aliens are eligible for some form of amnesty and some are not. For those who are not, the new immigration law will allow many of them to obtain temporary legal status. For all illegal aliens, the penalties will discourage farmers from hiring illegal workers, reducing their incentive to continue looking for work.

If all or a substantial portion of the farmers comply with the law, there will probably be a downward shift in the labor supply. In terms of labor economics, Burton Elder, the Skagit Valley farmer and a graduate of Washington State University, said, "The new law will make more Mexicans stay home. This decrease in the supply of labor will cause an increase in labor costs, but it doesn't end there. Additional costs will come from more time spent on sit-down strikes in the fields and more negotiations with the workers for housing, heat, and clothes."

Under the law, farmers have the option of importing workers. However, farmers must pay for transportation (to and from Mexico), housing, worker compensation, and subsistence costs. These costs are substantially higher than farmers pay now; it may be less expensive simply to raise wages to a level that U.S. citizens will accept.

INS Deputy District Director Richard Smith sees another reason for an increase in wage rates. "Right now society has these people under its thumb," says Smith. "When they obtain legalization, they will demand fair wages." Smith sees higher wage rates and food prices as the ultimate result, but says that the mechanization of agriculture "will put a lid on that."

Some people feel that the law's effects will be minimal and that growers will not have to change their hiring procedures. The INS will receive additional funding of $422 million in 1987 and $419 million in 1988 for enforcement. While the additional funds may provide for forty-five hundred immigration agents trying to keep out an estimated one million people, the smart money is on the people trying to get in, not those trying to keep them out. As long as there is a shortage of labor in U.S. agriculture and significant unemployment in neighboring countries, a natural flow of labor will take place.

The Future

For the farmer faced with hiring decisions, many variables are still unknown: the resolve of the INS in enforcing the law, the number of illegal aliens that will qualify for and be granted amnesty, and the ability of the remaining illegal aliens to work around the law by means of false IDs. The new immigration law establishes a two-year grace period—from November 1986 to November 1988—during which growers will receive some indication of just how strictly the regulations will be enforced. The INS may choose to make examples out of employers who repeatedly violate the law, forcing them to recognize the severe economic impact of noncompliance. The degree to which the INS will enforce the new law is directly related to the level of funding it receives, which is as yet undetermined by the Office of Management and Budget. The level of funding will also determine whether a proposed ID verification system will be created to eliminate those illegal aliens with false IDs from the legally available work force.

Many growers will probably postpone choosing to comply or not comply because the grace period will give them time to familiarize themselves with the law and the level of its enforcement. During this period most growers will put forth a token effort to abide by the law. If farmers take this course of action, they should make a concerted effort to stay up-to-date on all the aspects of the law's enforcement and be ready to alter their hiring procedures should the need arise.

Whatever course of action farmers choose —complying with the law, making a token effort, or noncompliance—one thing remains clear. The Burton Elders of Washington need to pay strict attention to court cases that rule on discrimination in citizenship status, watch the news to follow the extent to which the INS enforces the law, and look for signs of change in the field labor supply. Changes may come from several directions at once. In the next two years the Immigration Reform and Control Act of 1986 will, no doubt, affect the lives of farmer and immigrant alike. ıllı

The authors are MBA students at the University of Washington.

REGION WATCH

Economic Developments in the Pacific Northwest

With the national economy in a fifth year of expansion, the economic outlook in much of the Pacific Northwest has brightened. Total employment in Oregon and Washington has been rising at an annual rate of more than 3 percent in recent months. Oregon's monthly unemployment rate fell steadily from September 1986 through March 1987, the latest month on record. Idaho's economy, however, remains weak, and employment declines have been posted in recent months.

The strength in Oregon and Washington comes from several sources. Service sector employment has been expanding. The forest products sector has stabilized in terms of employment, with record-level output and strong profits for many companies. The contraction of computer-related activity in the high-tech sectors seems to have ended, and new product lines raise hopes for growth in coming months. Aerospace employment is approaching 90,000 in Washington and seems likely to remain near that level.

Now that Oregon has been added, with Washington, to the category of basically healthy economies in mid-1987, only the agriculture- and minerals-based Idaho economy remains in a precarious state.

Forecast panel

With this issue of Regionwatch, we introduce a new regular forecast feature: a panel of 17 distinguished economists from Washington, Oregon, and Idaho. These panel members are among the leading forecasters in the Pacific Northwest (Table 1), and, as a cross-section of business, government, and academia, their combined insights will provide business planners and policymakers with a new regional source against which they can compare their own assessment of the northwest's economy.

Economic forecasting is carried out with a variety of methods, including econometric models, time series projections, leading indicators, surveys of intentions or expectations, and judgmental methods. Stephen McNees, an economist at the Federal Reserve Bank of Boston who is the unofficial referee in the evaluation of the track record of national economic forecasts, has concluded that there is no such thing as a best forecast, forecaster, or forecasting method (*New England Economic Review*, July/August 1985). Since no one forecaster is accurate all of the time or for all variables, we have pooled the perspectives of our panelists and offer you the consensus of their thinking.

Modest growth

The projections for 1987 and 1988 from the forecast panel call for continued economic expansion at modest rates. Our panel's median forecast of real Gross National Product growth for 1987 is 2.3 percent, with the 1988 forecast picking up to 2.8 percent. Along with that modest acceleration of real growth, the panelists also call for an acceleration of inflation, with a 3.7 percent forecast for the increase in the Implicit Price Deflator for GNP in 1987 and a 4.5 percent increase in 1988.

At the regional level, the panelists foresee a modest growth of personal income and employment (Table 2). With employment growth rate forecasts below the pace of recent months, personal income growth forecasts are for moderate growth. In Washington, the median forecast of nominal personal income calls for an increase of 5.2 percent in 1987 and 5.8 percent in 1988. Given the median inflation forecast, a real rate projection of 1.5 to 2 percent is inferred in each year. Oregon's economists are calling for slightly stronger growth—5.4 percent in 1987 and 6.0 percent in 1988 in nominal terms. These projections forecast a real growth rate of close to 2 percent in both years. In Idaho, however, the projections for 3.5 percent growth of nominal personal in-

Table 1: *Pacific Northwest Executive* Economic Forecast Panel

WASHINGTON

Cleve Anschell, *Economics Department,* Rainier National Bank

Clarence H. Barnes, *Dean,* School of Business Administration, Gonzaga University

Susan Doolittle, *Economist,* Port of Seattle

Lynn Michaelis, *Chief Economist,* Weyerhaeuser Company

Belinda Pearson, *Consulting Economist*

Chang Mook Sohn, *Chief Economist,* Economic and Revenue Forecast Council

Thomas F. Tabasz, *Economist,* First Interstate Bank of Washington

OREGON

Ray M. Broughton, *Vice President and Economist,* First Interstate Bank of Oregon

Ann Nolan Hanus, *Chief Economist,* Executive Department, State of Oregon

John W. Mitchell, *Vice President and Economist,* U.S. Bank

Ham Nguyen, *Corporate Planning,* Portland General Electric

W. Ed Whitelaw, *Professor,* University of Oregon, *President,* ECO Northwest

IDAHO

Michael H. Ferguson, *Chief Economist,* Division of Financial Management, State of Idaho

Donald W. Holley, *Economist,* Ore-Ida Foods Inc.

Jack G. Peterson, *President and Chief Economist,* Idaho Mining Association

Don Reading, *Economist,* Ben Johnson Associates

Charles L. Skoro, *Associate Professor,* College of Business, Boise State University

Table 2: Panel Forecasts of State Personal Income and Employment (medians)
Annual percent change

	NOMINAL PERSONAL INCOME	NONAGRICULTURAL EMPLOYMENT	MANUFACTURING EMPLOYMENT
WASHINGTON			
1987	5.2	2.3	0.8
1988	5.8	2.1	1.0
OREGON			
1987	5.4	2.8	1.0
1988	6.0	2.5	1.3
IDAHO			
1987	3.5	1.0	0.4
1988	4.0	1.0	1.0

come in 1987 and 4.0 percent growth in 1988 infer constant or even declining real personal income.

Trade policy

We asked our panelists to comment on trade policies associated with Representative Gephardt, Treasury Secretary Baker, and Federal Reserve Board Chairman Volker. The panel members universally condemned the Gephardt Amendment, using such phrases as "protectionist," "likely to induce a trade war," and "poses a grave threat to both trade and international relations." Baker got mixed reviews, with some panelists approving his efforts to stem the downward slide of the dollar and his focus on the problems of Third World countries, and others condemning his policies for inducing the dollar's perhaps uncontrollable slide in value. Volker received strong approval for his policies.

Federal spending

The Bureau of the Census has recently published a report on state-by-state federal spending patterns. Total expenditures by the federal government in fiscal 1986 increased by 4.7 percent to $3.0 billion in Idaho and by 2.9 percent to $7.4 billion in Oregon, but by only 1.2 percent to $16.9 billion in Washington. Most expenditure categories in Washington went up in 1986, including state and local government grants (+$79 million), salaries and wages paid to federal employees (+$107 million), and direct payments to individuals (+$266 million). However, procurements from firms in Washington—including defense contractors, building and renovating weapons systems, base support services, supplies, and Hanford Reservation research and facility operations—decreased by $302 million, offsetting much of the increase in other expenditures.

State-by-state rankings of per capita expenditures by the federal government reveal some interesting patterns. The profiles for Washington and Oregon bear little resemblance. With fewer military bases and defense contractors, Oregon ranks 48th among all states in per capita federal procurements, 38th in wages and salaries, but 15th in state and local government grants. Washington is ranked 11th in procurement, 8th in salaries and wages, but only 35th in state and local government grants. Idaho, a small state with some large federal facilities involved in land management and energy research, falls in the lower half of the state-by-state distribution in all factors except procurements, in which it ranks 22nd, and the "other" category, in which it ranks 9th. "Other" federal expenditures are significant in Idaho due to large per capita payments for agricultural commodity programs.

Ports revisited

Commissioners of the Port of Portland, which has lost money on its marine terminal operations for several years, recently turned down a staff proposal for a $7 million to $8 million investment in a soda-ash loading facility, citing concerns about the economic prospects for the facility. The new president of the commission, appointed by Governor Goldschmidt, also expressed concerns about the economic viability of the marine terminal and ship repair facilities. Those concerns may stem from the fiscal 1986 annual report from the Port of Portland, which shows a deficit in every segment of its operations.

In Washington, meanwhile, the Port of Seattle (POS) marine terminals slipped into the red, according to the 1986 annual report. Although a good deal of new business has been secured by the POS to counter SeaLand's departure for Tacoma, the adjustment process turned a modest

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Worth Reading

Washington's Challenges and Opportunities in the Global Economy.

Washington State Economic Development Board. Report to the Legislature, Vol. I, January 1987, Sea-Tac Office Center, Suite 408, Seattle, WA, 114 pp., no cost.

In the fall of 1985, Governor Booth Gardner appointed the Economic Development Board, a group of business people, politicians, state bureaucrats, and academics charged with developing a long-term economic development strategy for the state. The Economic Development Board's recommendations make a persuasive case for global influences in Washington's economy and for Washington's potentially significant role in the expansion of trade across the Pacific. The report relies heavily on statistics about the economic growth of Pacific Rim economies to support its global economy arguments. To reinforce its argument about global influences on the state's economy, the report contains a map that shows Washington in the center of the world, demonstrating graphically our advantage over California ports in shipping time to Asian ports as well as our close proximity to European capitals and the Soviet Union via Arctic routes. *Washington's Challenges and Opportunities* argues that Washington faces some critical choices—in areas such as education and tax reform—that will determine the success of the state economy in the remaining years of the 20th century.

This report is well written, controversial, and recommended reading for anyone concerned about state economic development policy. The factual information and the questions raised are well worth thinking about.

The Washington State Economy: An Assessment of Its Strengths and Weaknesses.

Washington State Economic Development Board. Report to the Legislature, Vol. II, January 1987, Sea-Tac Office Center, Suite 408, Seattle, WA, 113 pp., no cost.

This report is what its title proclaims: an incisive self-examination of the strengths and weaknesses of the Washington economy. It is broad in its scope but filled with absorbing facts and fresh observations about life and industry in Washington State.

Thinking of locating a new plant in Washington? Trying to attract capital or personnel from afar? Wondering what the state has to offer in the form of economic opportunity? Shun the slick brochures and spend an hour with this volume. It will give you a Martian view of the economy of the state with amazing objectivity. It is an absorbing inventory of our assets and liabilities, our promise and problems. It makes well-balanced observations about where Washington stands in respect to a variety of issues, such as quality of life, education, taxes, infrastructure, trade, and tourism.

The Washington State Economy is not a boring technical document, but a first-rate piece of reporting about the prevailing economic environment. There is plenty of easy-to-read documentation in the form of tables and charts. This report is recommended reading.

moneymaker into a moneyloser last year. Progress continues at the Port of Tacoma, which operates in the black and brings innovations to the waterfront. State-of-the-art cranes, double-decker rail container cars, multimodal container handling facilities, and a new, automated customs system have boosted the success of this aggressive and successful competitor.

The ports and related service industries now face the challenge of developing the export side of their businesses as the volume of imports declines in response to the weaker dollar. Overall, port facilities are highly capital intensive, and rates of return on these investments are sensitive to capacity utilization. A more restrictive U.S. import policy could put a brake on the growth of total overseas commodity trade, raising new concerns about the viability of the ports and related industries.

New strength in forest products

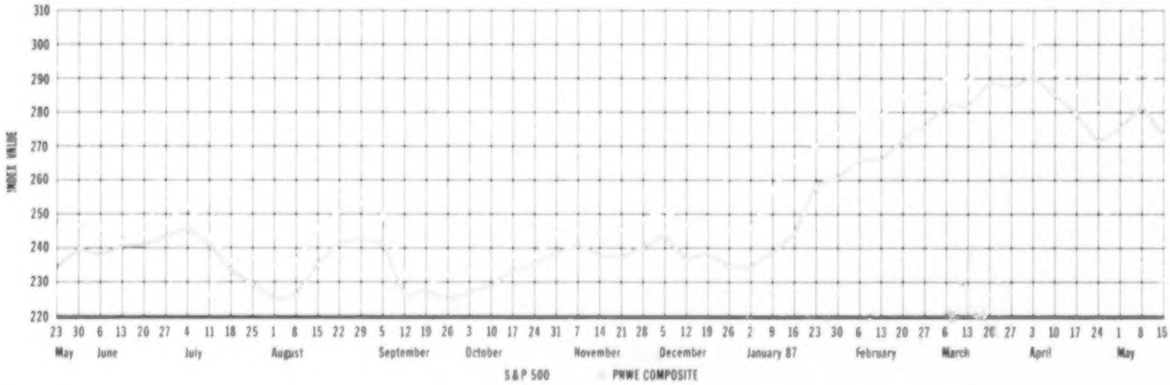
Several indicators point to the renewed strength of the region's forest products industry: high output levels, many firms reporting strong profits, and extraordinary productivity levels compared to 1979. Last year's interest rate reductions, a strong housing market (at least through the early months of 1987), and the vigor of the export segment of the market all helped, as did the cost-cutting labor agreements of the last several years.

One of the interesting consequences of the industry's restructuring is a new Portland firm, WTD Industries, started by an entrepreneur who took advantage of a number of mill bankruptcies. With 17 mills, WTD Industries is now the country's ninth largest lumber firm. President Bruce Engel, a former bankruptcy lawyer who represented mill owners, started acquiring, in 1981, a number of mills that were failing financially. According to *Forbes* (April 6, 1987), Engel used the bankruptcy law to his advantage, gaining wage and work rule concessions and, in some cases, publicly subsidized financing.

Dependent on stumpage acquired in the open market, WTD Industries has less control over raw materials than large, integrated competitors. The risks of competitive bidding for stumpage are among the factors that drove many milling firms into bankruptcy in the early 1980s. If WTD Industries proves viable in the long haul, it will represent interesting examples of an entrepreneur who saw an opportunity where others saw only looming bankruptcy and of an alternative to economic disaster for small communities with no industrial base other than milling.

The Pacific Northwest Executive Stock Index

S&P 500 and the PNWE Index, May 23, 1986–May 15, 1987



Index Values

LAST FRIDAY OF	PNWE COMPOSITE	SMALL FIRMS	LARGE FIRMS	MANUFAC-TURING	TECHNOLOGY	UTILITIES	RETAIL FINANCE & OTHERS
JUNE 1986	245.10	282.08	248.63	250.74	218.67	247.14	243.57
JULY 1986	230.07	280.99	234.04	233.16	196.69	260.12	219.14
AUG 1986	242.89	282.59	248.46	245.72	192.38	269.67	233.74
SEPT 1986	224.44	290.66	229.31	225.69	186.62	244.92	217.78
OCT 1986	239.01	321.75	242.98	238.66	213.39	254.76	236.37
NOV 1986	239.78	316.58	241.11	238.09	231.63	257.59	232.97
DEC 1986	234.36	337.84	234.59	239.09	223.23	247.44	221.15
JAN 1987	260.12	368.42	251.99	266.74	285.37	261.00	239.52
FEB 1987	276.29	401.15	266.71	284.67	302.00	254.23	265.12
MAR 1987	423.64	272.71	301.67	315.47	252.99	275.03	275.03
APR 1987	403.55	252.63	282.37	315.19	235.24	259.70	259.70
MAY 1987*	419.58	252.17	267.97	357.24	233.47	276.34	276.34

*as of May 15, 1987

Kraig Hills, an MBA student and member of the *Pacific Northwest Executive* staff for the last year, has completed his degree and accepted a position with First Interstate Bank in Los Angeles. We are grateful for his contributions to the Regionwatch section of the magazine and wish him well as he enters the banking industry.

The Devaluation of the Dollar

According to the U.S. Department of Commerce, 173,500 workers in Washington, Oregon, and Idaho were employed in 1983 in positions directly or indirectly related to the manufacture of goods destined for foreign markets. A total of 5.7 percent of Washington's work force, 4.2 percent of Oregon's, and 3.3 of Idaho's were dependent on foreign exports of manufactured goods for their livelihoods. Washington's economy is especially export dependent (only Alaska has a higher proportion of manufacturing jobs related to exports, and only Massachusets has a greater proportion of all jobs dependent on manufactured exports.) Airplanes, ships, wood products, instruments, and food products are among the many manufactured goods shipped overseas from Pacific Northwest manufacturers.

With such an extraordinary dependence on export markets, this region has a large stake in the success of the efforts of the G-5 group (United States, United Kingdom, France, Germany, and Japan) to encourage a devaluation of the U.S. dollar. Since the September 1985 meeting of the G-5 finance ministers and the U.S. Secretary of the Treasury in Geneva, public statements and occasional market interventions have been aimed at devaluation. The goal of these efforts was to move the world economy in the direction of lower U.S. trade deficits. Recently, the G-5 group has held discussions about stabilizing the dollar, even though little change has yet been seen in the U.S. trade balance.

The impact of these discussions and the extent to which they have been backed by policy actions is debatable. Some economists feel that markets set exchange rates and that policy makers have little influence, while others believe that intervention can at least have a short-term impact. The link between exchange rates and trade balances is even more tenuous.

In examining the extent of devaluation and its regional implications, we found it necessary to construct a new Pacific Northwest foreign exchange index. This index may be a better measure of the relative value of the dollar for Pacific Northwest companies than the indexes used at the national level.

Exchange Rates and Trade Patterns

Starting with the September 1985 meeting of the G-5 group, the world's leading industrial countries have encouraged a reversal of the extraordinary 1980 to 1985 climb in the value of the dollar relative to other currencies. As measured by the widely used U.S. Federal Reserve Board (FRB) foreign exchange index, the value of the dollar rose by nearly 64 percent from 1980 to 1985. Following the G-5 initiative, the dollar fell 27 percent between 1985 and 1986.

A devaluation does not immediately improve a country's trade balance; in fact, the J-curve effect—a pattern of adjustment over time—suggests that the situation will get worse before it improves. A 10-percent decline in the exchange value of the dollar makes the price of imports that much higher, thereby raising the cost of those imports and worsening the trade balance. U.S. consumers react to higher imported product prices by turning to domestic substitutes, and the import bill then falls. In other countries, the depreciation of the dollar makes U.S. goods less expensive. U.S. exporters earn less for each unit that they export, and the dollar value of exports initially falls, worsening the trade balance. Foreign buyers then increase their purchases of relatively cheaper U.S. goods, and the value of exports rises.

How long does it take for the long-run quantity changes to offset the initial adverse price effects? It is generally assumed that after a year or so the long-term changes begin to dominate the trade statistics. However, careful empirical studies show lags ranging from 4 to 36 months.

As yet, we have not reached the expansionary phase of the J-curve. We have not yet seen any substantial impact of devaluation on the value of exports, and the impact on imports is ambiguous. Exports averaged $17.6 billion per month in 1985 and $18.1 per month in 1986. Imports averaged $30.1 billion in 1985, but rose to an average of $32.2 billion in 1986, more than offsetting the rise in exports.

Several explanations have been advanced for the failure of our trade situation to respond to the devaluation of the dollar. The J-curve theory says that import bills should first rise, then fall after a devaluation. However, it takes time for consumers to switch to alternative sources, for producer contracts to expire and new ones to be negotiated, and for exporters to set up new distribution channels. We may not have waited long enough yet for these adjustments. An alternative explanation is that U.S. consumers prefer imported goods and are choosing to continue such purchases despite higher costs. A third explanation is that foreign manufacturers, particularly Japanese automobile manufacturers, have decided to absorb the effects of devaluation by reducing their profit margins in order to preserve their U.S. market shares. At the same time, U.S. manufacturers, notably the automobile companies, have raised their prices to take advantage of the devaluation, thereby giving consumers little incentive to reject imports. A fourth possibility is that short-run adjustments in asset markets may have relieved much of the pressure to change goods and services trading patterns. A final explanation is that an inappropriate index has been used to measure the extent of the dollar's change in value relative to other currencies. Consequently, the incentive to cut back on imports may have been poorly gauged. This line of inquiry has important regional implications.

Alternative Exchange Rate Indexes

Several economists claim that the FRB index may be a poor measure of the dollar's value in world commerce. This index is based on early 1970s trade patterns and a very limited sample of countries (eight European countries plus Canada and Japan). Rapid expansion of trade across the Pacific and with less developed countries in the Southern Hemisphere have made the FRB index less relevant. The Dallas Federal Reserve Bank has constructed an index based on 131 currencies, including those of many of our new trading partners. This index fell only 6 percent from early 1985 to May 1986, while the FRB index fell 34 percent over the same time period. This suggests that the current devaluation may have produced only a small adjustment of the exchange rates relevant to current trading patterns, even if the adjustment was substantial for a few key currencies.

Since various regions within the United States have their own distinct trading patterns, regional indexes might be the best way to assess the trading opportunities of those particular geographical areas. The Chicago Federal Reserve Bank has constructed a foreign exchange index based on the trading patterns of the Seventh Federal Reserve District. While this index usually follows the FRB index, its movements are less extreme. The Chicago index fell less in 1978 and 1979 and did not reach as high a peak in 1985.

An Inflation-Free Exchange Rate Index for the Pacific Northwest

The FRB, Dallas, and Chicago indexes are not likely to reflect the trading possibilities we face in the Pacific Northwest. Our trade is much more oriented toward Pacific Rim countries, while the midwestern and eastern portions of the United States trade more with Europe and South America. The currencies of Pacific Rim countries have not moved uniformly in the past several years, and they have not all moved in the same direction since the devaluation started (see Table 1 for a sample).

In order to assess more accurately the Pacific Northwest's trading prospects with the devalued dollar, we have constructed an exchange rate index for the region. The PNW index, shown in Figure 1, is based on exchange rates with the 16 countries that are the Pacific Northwest's largest trading partners. Since in-country price level changes can offset changes in the foreign exchange rate, we have constructed the index in real terms, using indexes of the extent of price change in goods exported from each country to remove inflationary effects from the exchange rates. The combined imports and exports of these 16 countries through the Seattle and Portland customs districts are used to weight the bilateral exchange rates.

The PNW index did not increase as rapidly as the FRB index in the early 1980s. While the FRB index increased by 57 percent from 1979 to 1984, the PNW index increased only 15 percent. Consequently, imports did not have the advantage, nor exports the disadvantage, in the Pacific Northwest that one might have believed based on the FRB index.

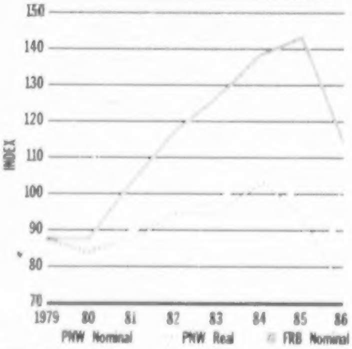
Import-dependent businesses have grown rapidly in Washington in recent years. The Washington Input-Output Study for 1982 showed a much greater dependence on foreign imports by this state's businesses than did the 1963 input-output study. Our regional ports have also expanded rapidly in containerized import traffic. This growth is all the more extraordinary when one realizes that the dollar has appreciated rather modestly with respect to the currencies of the countries from which regional businesses have imported finished goods, components, and raw materials.

The PNW index began to fall earlier than the FRB index in the mid-1980s; the PNW index declined from 1984 to 1986, while the FRB index increased from 1984 to 1985 and declined only from 1985 to 1986. The decline was greater for the PNW index, which fell 27 percent from 1984 to 1986, than for the FRB index, which fell only 19 percent. Absent new barriers to trade, Pacific Northwest exports should be more likely to increase, and imports to the Pacific Northwest should be more likely to fall, than in the country as a whole.

This dramatic decline in the PNW index is an important phenomenon. Unless foreign import sources choose to absorb part or all of the devaluation, the prices in U.S. dollars of imported goods should be increasing rather rapidly. Consumers in the United States should cut back on their consumption of such goods in the future or switch to domestic substitutes. This trend should limit the major Pacific Northwest ports' ability to expand containerized cargo handling, since such cargo has traditionally been tilted toward the import side of trade.

Given the devaluation shown by the PNW index, makers of airplanes, instruments, machinery, processed foods, and other goods should find that their products are more competitive in foreign marketplaces. Devaluation alone, however, will not provide significant relief for the hard-pressed agricultural sector. With the extensive supply of grains stockpiled throughout the world and the self-sufficiency of many traditional wheat customers, export growth opportunities will remain limited for many agricultural commodities.

Figure 1: Foreign Exchange Rate Indexes
Pacific Northwest and Federal Reserve Board



SOURCE: Pacific Northwest Annual Economic Indicators (*Pacific Northwest Executive*, July 1987, page 13)

The growth of trade across the Pacific has led to the idea of the 21st century as the "Century of the Pacific." The new PNW exchange index reflects this orientation toward the Pacific Rim by its inclusion of several Asian currencies that are not a part of the traditional FRB index, and by the greater weight that it gives—in comparison to the FRB index—to trade with Japan. The PNW index should prove to be a better gauge of the strength of the U.S. dollar vis-à-vis the Pacific Northwest's current and future trade partners than the FRB index or the very broad-based Dallas index. Efficient international asset markets and ingrained consumption and trading patterns suggest, however, that the adjustments indicated by the PNW index will take place rather slowly.

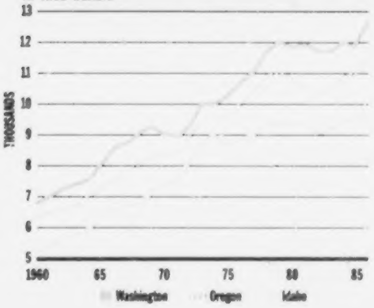
Table 1: Real Foreign Exchange Rates
foreign currency units per U.S. dollar, deflated by Exchange Unit Values

YEAR	AUSTRALIA	CANADA	JAPAN	PHILIPPINES	TAIWAN
1979	1.09	1.14	244	7.93	0.38
1980	1.18	1.19	203	7.60	0.36
1981	1.05	1.15	207	7.73	0.38
1982	0.94	1.19	231	7.68	0.40
1983	0.92	1.18	210	15.83	0.39
1984	0.84	1.25	224	36.53	0.39
1985	0.78	1.37	180	34.70	0.38
1986	0.78	1.32	133	37.70	0.36

SOURCES: International Monetary Fund, and Directorate-General, Republic of China

Pacific Northwest Annual Economic Indicators

REAL PERSONAL INCOME PER CAPITA
in 1982 dollars



POPULATION[A,1]
in thousands

YEAR	WA	OR	ID
1960	2,853	1,769	667
1965	2,867	1,937	686
1970	3,409	2,091	713
1975	3,621	2,330	832
1980	4,132	2,633	944
1982	4,276	2,668	977
1983	4,302	2,658	987
1984	4,349	2,676	999
1985	4,409	2,687	1,005
1986	4,463	2,698	1,002

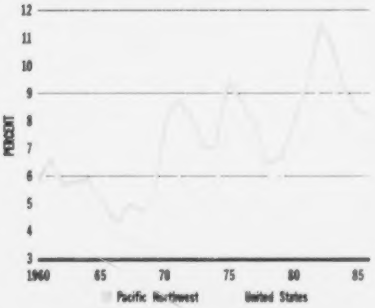
PERSONAL INCOME[B]
in millions $

YEAR	WA	OR	ID
1960	6,772	3,930	1,236
1965	8,867	5,329	1,679
1970	13,827	7,795	2,378
1975	22,484	13,305	4,360
1980	42,510	24,560	7,673
1982	49,814	27,130	8,845
1983	52,031	28,536	9,308
1984	55,472	31,056	10,153
1985	58,507	32,667	10,653
1986	64,699	35,655	11,459

FARM INCOME[B]
in millions $

YEAR	WA	OR	ID
1960	268	185	159
1965	288	186	238
1970	356	227	274
1975	866	390	434
1980	858	540	518
1982	1,004	496	469
1983	1,081	488	466
1984	1,100	566	554
1985	1,085	483	492
1986	1,148	605	520

UNEMPLOYMENT RATE



IMPLICIT[B] PRICE DEFLATOR
for personal consumption
1982 = 100

YEAR	US
1960	34.9
1965	37.5
1970	44.9
1975	60.8
1980	86.9
1982	100.0
1983	103.7
1984	107.0
1985	111.6
1986	113.9

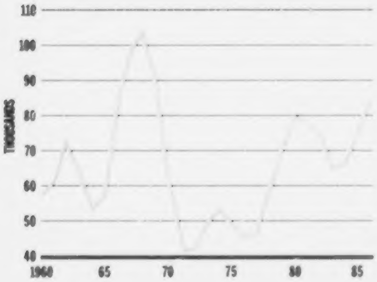
UNEMPLOYMENT[F] RATE
percent of labor force

YEAR	WA	OR	ID
1960	6.4	4.9	6.0
1965	5.4	4.6	4.8
1970	9.2	7.1	5.8
1975	9.5	10.6	7.3
1980	7.9	8.3	7.9
1982	12.1	11.5	9.8
1983	11.2	10.8	9.8
1984	9.5	9.4	7.2
1985	8.1	8.8	7.9
1986	8.2	8.5	6.5

TOTAL[F] EMPLOYMENT
in thousands

YEAR	WA	OR	ID
1960	1,020	682	264
1965	1,107	776	267
1970	1,285	803	281
1975	1,412	929	324
1980	1,828	1,188	396
1982	1,779	1,171	401
1983	1,838	1,196	413
1984	1,857	1,210	430
1985	1,917	1,200	434
1986	2,000	1,233	402

AEROSPACE EMPLOYMENT IN WASHINGTON



NONAGRICULTURAL[F] WAGE AND SALARY EMPLOYMENT
in thousands

YEAR	WA	OR	ID
1960	812.6	509.2	155.2
1965	896.6	607.4	177.6
1970	1,080.0	709.2	209.3
1975	1,225.7	837.4	273.0
1980	1,608.3	1,044.6	330.9
1982	1,569.1	966.7	317.9
1983	1,586.1	966.7	317.9
1984	1,659.9	1,004.0	325.9
1985	1,710.4	1,030.0	338.3
1986	1,770.2	1,056.5	334.3

AEROSPACE[F] EMPLOYMENT
in thousands

YEAR	WA
1960	57.8
1965	57.0
1970	61.5
1975	50.4
1980	79.6
1982	75.0
1983	65.0
1984	66.6
1985	76.0
1986	85.0

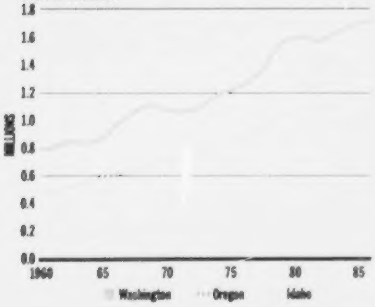
LUMBER AND WOOD[F] PRODUCTS EMPLOYMENT
in thousands

YEAR	WA	OR
1960	44.4	71.9
1965	46.9	74.2
1970	42.2	66.8
1975	47.2	69.6
1980	47.0	69.5
1982	39.0	55.6
1983	42.2	62.6
1984	41.3	66.0
1985	38.3	63.6
1986	37.9	63.9

PAPER[F] EMPLOYMENT
in thousands

YEAR	WA
1960	18.0
1965	19.8
1970	19.8
1975	16.4
1980	17.6
1982	16.2
1983	15.8
1984	16.2
1985	16.7
1986	16.9

NONAGRICULTURAL WAGE AND SALARY EMPLOYMENT



CONSTRUCTION EMPLOYMENT[F]
in thousands

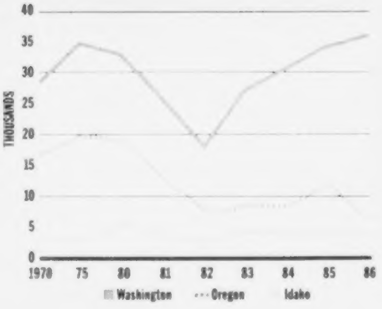
YEAR	WA	OR	ID
1960	44.6	26.1	9.6
1965	46.4	26.1	9.6
1970	53.3	29.5	10.9
1975	59.5	35.3	16.1
1980	92.6	46.5	15.8
1982	75.6	28.9	13.8
1983	74.2	27.0	13.1
1984	79.6	29.9	13.2
1985	80.6	33.1	15.6
1986	85.2	34.1	14.5

MANUFACTURING EMPLOYMENT[F]
in thousands

YEAR	WA	OR	ID
1960	216.6	144.4	28.9
1965	227.0	158.2	33.3
1970	239.4	172.3	40.4
1975	244.0	182.1	47.8
1980	308.7	215.1	53.3
1982	289.9	185.7	47.8
1983	278.4	188.8	50.3
1984	288.1	198.7	54.1
1985	295.5	199.3	55.2
1986	304.2	196.7	52.2

YEAR	CONSTRUCTION CONTRACTS[C] *in millions $*			NEW HOUSING UNITS[A,4] AUTHORIZED *in numbers of permits*			AVERAGE[D,2] LUMBER PRICE *1000 board ft.*	PLYWOOD[E,3,4] PRODUCTION *in million board ft.*
	WA	OR	ID	WA	OR	ID	PNW	WA & OR
1960	632.3	364.6	115.4	NA	NA	NA	$75.01	6.535
1965	1.006.7	565.7	186.8	20.131	15.610	1.846	76.09	9.720
1970	1.478.2	634.3	197.4	28.262	16.980	3.565	91.08	8.663
1975	2.019.3	1.035.9	398.6	35.209	20.091	3.066	154.63	7.722
1980	4.795.1	1.926.1	634.5	33.375	19.480	5.795	267.59	6.766
1982	3.394.8	1.379.9	508.4	17.891	7.720	2.536	198.43	5.700
1983	3.667.8	1.414.7	544.8	27.481	8.694	4.225	228.88	8.141
1984	3.748.1	1.744.7	617.6	30.400	8.055	4.308	215.01	8.319
1985	4.409.1	1.633.8	758.0	34.316	11.977	4.372	214.49	8.440
1986	4.854.4	1.515.3	659.5	36.214	10.284	3.819	218.47	9.545

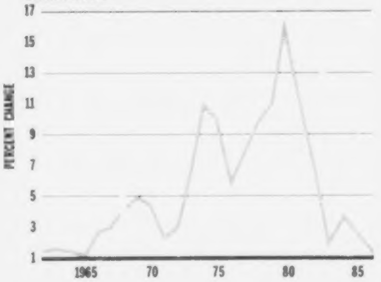
NEW HOUSING UNITS AUTHORIZED



YEAR	LUMBER PRODUCTION[D,4] *in million board ft.*		WOOD PULP[A] PRODUCTION *in thousand short tons*		LOG[G] EXPORTS *in million board ft.*	FOREIGN TRADE[A,5] *Portland and Seattle Customs Districts in millions $*	
	WA	OR	WA	OR	WA & OR	EXPORTS	IMPORTS
1960	3.377	7.402	NA	NA	NA	625	305
1965	3.648	7.580	NA	NA	901	829	427
1970	3.189	6.680	3.848	2.643	2.216	2.688	1.651
1975	3.104	6.342	3.585	2.480	2.225	6.224	4.781
1980	3.161	5.784	3.519	3.787	2.632	15.770	11.836
1982	3.059	4.682	3.394	2.656	2.568	12.208	11.899
1983	3.821	6.579	3.622	2.845	2.592	13.723	12.826
1984	3.697	7.202	4.180	2.846	2.722	14.216	16.323
1985	3.419	7.211	4.100	2.794	3.004	15.533	17.349
1986	3.800	8.100	NA	NA	2.785	19.987	18.006

CONSUMER PRICE INDEX (CPI—U)

Seattle/Everett



YEAR	ALUMINUM[H,6] PRODUCTION *in thousand tons*	ELECTRICITY[I,7] PRODUCTION *in megawatts*	BPA ENERGY SALES[J] *in millions of KWH*
	PNW	PNW	
1960	527.3	69.386	29.449
1965	796.5	99.873	37.211
1970	1.390.0	143.993	56.327
1975	1.411.0	171.797	68.934
1980	1.574.4	206.221	72.448
1982	1.135.6	184.822	81.381
1983	1.174.8	181.405	82.781
1984	1.574.3	195.157	87.936
1985	1.356.4	193.093	83.802
1986	1.242.8	199.758	81.587

FOREIGN EXCHANGE INDEXES

YEAR	PNW[K,8] Nominal	PNW[K,8] Real	Federal[L,9] Reserve Board Nominal
1979	88.09	88.09	88.09
1980	83.87	84.41	87.39
1981	89.30	85.67	102.94
1982	94.97	93.92	116.57
1983	97.68	93.40	125.34
1984	106.76	101.48	138.19
1985	96.81	93.20	143.01
1986	86.60	74.00	112.22

YEAR	CONSUMER PRICE INDEX[M,10] *1967 = 100*		AVERAGE PRICE[J,11] OF BPA POWER SALES *in mills per KWH*	AVERAGE HOURLY EARNINGS[F] *for manufacturing employees*		
	PORTLAND	SEATTLE/EVERETT		WA	OR	ID
1960	87.1	87.9	2.30	$2.63	$2.55	$2.25
1965	94.6	94.5	2.36	2.98	2.94	2.65
1970	113.2	114.0	2.38	4.06	3.82	3.29
1975	156.5	155.8	3.40	5.82	5.53	4.77
1980	255.4	252.1	6.25	9.41	8.65	7.55
1982	287.0	297.8	13.40	11.23	10.02	8.62
1983	290.1	302.8	16.60	11.42	10.21	8.98
1984	301.0	313.9	20.73	11.57	10.44	9.34
1985	312.4	321.9	21.14	11.63	10.50	9.41
1986	316.8	325.2	18.16	11.77	10.56	9.66

SOURCES

A. Bureau of the Census, U.S. Dept. of Commerce
B. Bureau of Economic Analysis, U.S. Dept. of Commerce
C. F.W. Dodge Division, McGraw-Hill Information Systems Co.
D. Western Wood Products Assoc.
E. American Plywood Assoc.
F. Washington State Employment Security Dept., State of Oregon Employment Div., State of Idaho Dept. of Employment
G. U.S. Forest Service
H. Direct Service Industries, Inc.
I. Pacific Northwest Utilities Conference Committe
J. Bonneville Power Administration
K. Computed by *Pacific Northwest Executive* using data from the International Monetary Fund and the Directorate-General, Republic of China
L. U.S. Federal Reserve Board
M. Bureau of Labor Statistics, U.S. Dept. of Labor

FOOTNOTES

1. Includes armed forces residing in each state; 1965, 1975, 1981-1986 are July 1 estimates
2. FOB mill realization, coast region (Oregon and Washington) for Douglas fir
3. Includes all types of structural panels
4. The 1986 figures are estimates
5. Data do not account for export of aircraft or shipments that pass through the Northwest and clear customs elsewhere. The 1960 figures do not include imports or exports by air
6. Includes six primary producers in Washington, Oregon, and Montana
7. One Megawatt = 1.000 kilowats
8. PNW indexes weighted by 1985 imports and exports through the Portland and Seattle Customs districts to/from 15 countries; real index deflated using Export Unit Values, base = 88.09 in 1979, which is equal to the Federal Reserve Board Index in 1979
9. Federal Reserve Board index based on 1972-76 trading patterns of eight European countries plus Canada and Japan, 1973 = 100
10. CPI for all urban consumers, annual average
11. One mill = 0.1 cents

The Economic Impacts of a Nuclear Waste Repository at Hanford

Hanford, Washington, is one of three potential sites for this nation's first high-level nuclear waste repository. Many residents of the Pacific Northwest are concerned about the environmental impact and the stigma of hosting such a facility. Furthermore, the site selection process used by the U.S. Department of Energy (DOE) to choose the three candidate sites (Hanford, Washington; Yucca Mountain, Nevada; and Deaf Smith County, Texas) has become quite controversial. There have been allegations that political motivations, rather than scientific investigations, drove the process. The politics of the issue suggest that a state with a relatively small congressional delegation may be more vulnerable to selection than states with large delegations. Having made the DOE "short list" for technical or political reasons, it is crucial for the Pacific Northwest's residents to think carefully about the impacts of the respository. The problem with thinking carefully is that the facility cannot be compared to other industrial enterprises, so that it is not obvious how one should evaluate its impacts.

The Repository Program

In May 1986 the Department of Energy and the president of the United States, acting under authority provided by the Nuclear Waste Policy Act of 1982, named the Hanford Reservation in eastern Washington as one of three candidate sites for the first high-level commercial nuclear waste repository in the United States. Following site characterization studies at all three locations, a single site will be nominated by the president as this country's first repository for the final disposition of high-level nuclear waste. According to the current schedule, the fateful announcement will be made in 1994 or 1995.

Assuming that the Nuclear Regulatory Commission (NRC) agrees to license the facility and that Congress overrides a likely veto of the site selection by the host state's governor, construction will begin in the late 1990s. The process will involve building an enormous minelike facility about 3,000 feet underground, as well as the erection of surface facilities to unload fuel casks and of hoists to transport them to the underground facility. The timetable in the Nuclear Waste Policy Act sets the date for the first shipment of spent fuel rods from commercial reactors and canisters of reprocessed defense waste from defense facilities nationwide for 1998. The DOE's current plans, however, call for the repository doors to open in 2003. The DOE will use the 1998 date as a deadline for building a monitored retrievable storage (MRS) facility, a temporary storage and fuel consolidation facility, at an eastern site. Once the nuclear waste repository is functional, trains or trucks will arrive at the site from the MRS at daily or weekly intervals for the next 30 years or so, bringing spent fuel rods from commercial reactors and canisters of defense waste from DOE facilities to be buried in underground vaults. After the repository has been filled to design limits (a maximum of 70,000 metric tons of heavy metal), the facility will be carefully monitored for 50 years, and then, assuming that no problems have developed, the repository will be backfilled and sealed. The spent fuel will remain below, thermally hot and radioactively dangerous, for at least 1,000 years. After about 10,000 years, the radioactive elements in the spent fuel will, on average, have decayed sufficiently to reduce radiation levels to that of naturally occuring ore deposits.

Frameworks for Assessing Impacts

No single analytic framework is appropriate to the task of assessing the potential impact of a nuclear waste repository on the host region. The longevity of the possible effects is quite extraordinary, making the study of potential impacts a complicated and unprecedented business. Three analytic frameworks offer significant insights into the potential impacts: benefit-cost analysis, risk analysis, and risk perception studies.

The benefit-cost approach. The usual tool economists employ to evaluate the desirability of a project is benefit-cost analysis. Lists of possible benefits and costs are drawn up, a dollar measure is assigned (where possible) to each benefit and cost, and the time at which each benefit and cost is likely to occur is noted. The present value of the costs and benefits are computed and then compared to decide if a project is socially desirable. Often, costs and benefits are difficult to reduce to a dollar value, and the analysis results in a qualitative tabulation of costs and benefits that decision makers must somehow weigh in their minds to reach a decision about the project.

The risk analysis approach. The risk analysis approach involves two central concepts: the probability that some event will occur (p_i) and the consequences of that occurrence (c_i). The expected risk of the event is the product of these two numbers: $r_i = p_i \times c_i$. Assuming that the consequences of different events can be assessed in a common measure (such as dollars of damage, lives lost, or days of work lost), then the total risk of a particular project can be measured by the sum of the expected risks of each separate event: $R = \Sigma r_i$. The process of risk analysis then involves defining the possible consequences of a project and estimating the probability that the events will occur.

For our purposes, the consequences fall into three categories: background noise, measurable impact, and catastrophic impact. Some events are so minor that existing measurement instruments cannot always reliably detect the event. A small increase in radiation against a background of various types of natural or man-made radiation is one example of background noise; a small increase in traffic fatalities, given that accidents occur all of the time, is another.

Other events are quite reliably detected and sized by existing measurement equipment. A train that derails and falls into a river will surely be detected, and the consequences of the derailment can be reliably measured. We refer to these events as measurable.

Massive accidents share one property with background noise: their consequences are difficult to measure reliably. The Bhopal chemical plant disaster, the Mt. Saint Helens volcanic eruption, and the Chernobyl reactor explosion and fire are examples of catastrophic events. All had multiple, simultaneous impacts—some of them poorly understood and all of which were difficult to detect and measure accurately due to the sheer enormity of the disaster.

Estimating the probability of the occurrence of these events is an artform engaged in by analysts who rely on past incidence of similar events, laboratory measurements, field tests, and sheer guesses. In our analysis, we will group the probability of events into three categories: common events that occur every day or at least several times a year, unusual events that a given individual might observe only a few times in his or her lifetime, and rare events that occur at intervals of less than once per generation.

The risk perception approach. Another perspective on nuclear repository impacts is provided by risk perception. People seem to fear nuclear projects to a degree that is out of proportion to the expected risks as measured by the risk assessment approach. For example, a sample of members of the League of Women Voters was asked to rate the relative risk of a number of activities and technologies, including fossil fuel and nuclear power generation. These lay people rated nuclear power about five times as risky as fossil fuel generation. Yet a carefully constructed professional analysis of the relative risks of nuclear versus fossil fuel generation—considering occupational and public health risks due to mining, processing, transportation of fuel and materials, plant construction, operation and decommissioning, and nuclear waste disposal—rated nuclear power generation as having only 0.7 percent of the risk associated with fossil fuel power generation (see Table 1). In the wake of the Three Mile Island and Chernobyl disasters and of new knowledge about acid rain and the global greenhouse effect, a professional preparing a new relative risk assessment today might place different odds on certain events or assign different consequences to them. It is likely, however, that a sample of lay persons and the professional risk assessor would still rank these two technologies very differently.

Table 1: Measures of Relative Risk

	PROFESSIONAL RISK ASSESSMENT	LAY PERSON'S PERCEIVED RISK
Nuclear power generation	0.4	250
Fossil fuel power generation	57.0	52
Ratio of nuclear to fossil risk	0.007	4.808

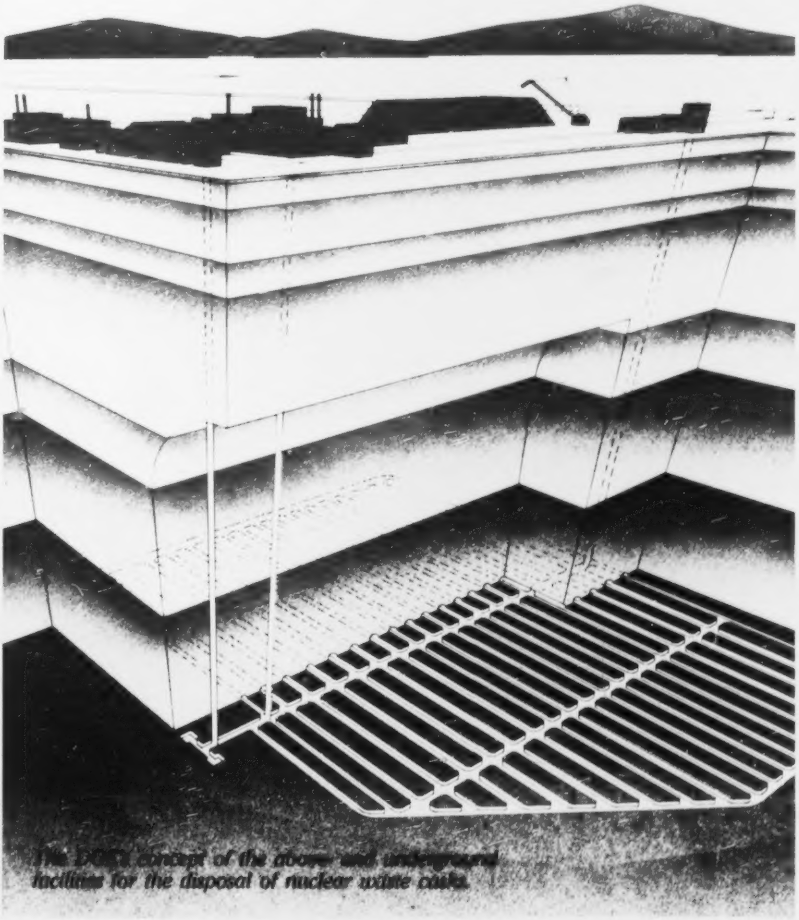
SOURCES: H. Inhaber, *Energy Risk Assessment*, 1982, page 50, and P. Slovic et al., "Perception of Risks from Nuclear Power," in G. T. Goodman and W.D. Rowe, *Energy Risk Management*, 1979, page 226

Public fears of nuclear facilities stem from two factors: how familiar or known a hazard is and how much the hazard is dreaded. Few people live or work in settings where radiation measurements or activity involving nuclear material is frequent. Because most people don't have a day-to-day, working familiarity with radiation, anything associated with radioactivity is feared. The dread that many associate with radioactivity no doubt stems to some degree from the graphic and horrifying images of thousands of Hiroshima and Nagasaki residents suffering from the ravages of the atomic bombs dropped in 1946. The dreaded quality of radioactivity also seems to stem from its physical properties: it cannot be seen, felt, or heard; it can only be detected with scientific instruments.

Impacts of a Repository

If a respository were built at Hanford, what kinds of impacts could we expect, and what could the consequences be within the three evaluation frameworks? We'll discuss the impacts for the three phases of a repository's lifetime: construction, operation, and postclosure.

Construction impacts. What would a nuclear repository at Hanford look like? It would resemble an immense mine between 2,850 and 3,460 feet underground, which would occupy approximately 2,000 acres. Tunnels would be mined in solid rock, and 11 million to 13 million tons of rock would be removed. On the surface, handling and temporary storage facilities would cover approximately 400 acres. Machinery would lower the spent fuel or reprocessed waste casks down a large shaft to the underground tunnels. Once underground, the casks would be moved on rail tracks and placed in horizontal or vertical shafts, and the shafts would then be sealed. Monitoring equipment would be in place to check air quality, radiological emissions, temperature, groundwater, and



The DOE's concept of the above- and underground facilities for the disposal of nuclear waste casks.

RANDALL HUNTING

other environmental variables.

The construction of these facilities is similar to large mining projects. The only unusual aspects of this project are the particular rock medium, which may be prone to rock bursts, the size of the vertical and horizontal shafts, and the need to keep the facility fully accessible and operational for about 90 years. Present engineering plans do not seem to present foreseeable problems of a vastly different character than previous large-scale mining and construction projects. That is not to suggest that the effort is trivial, only that it it within the range of experience of engineering and construction firms in most respects.

The major phases of the project and the work force and budget associated with each phase are shown in Table 2. The six-year site characterization program represents a substantial amount of activity, including sinking a large exploratory shaft down to the candidate repository level and a variety of research projects. At Hanford, the effort will entail a work force of 100 to 200 and a budget of $33 million to $94 million per year (all expenses are stated in 1987 dollars).

If the Hanford site were chosen as the single site for the first repository, a large construction program would begin sometime in the late 1990s. During the six-year construction period, an average of 450 workers, (1,100 workers in peak periods) would be employed on the project. The annual project budget would average $400 million.

If the on-site workers earn an average of $32,120 per year (the average hourly earnings of construction workers in Washington in 1986 × 2,000 hours per year; specialized skill requirements and overtime would drive the average higher), the total payroll associated with the construction phase could be in excess of $14 million. At the peak point of the construction process, that figure could double. Secondary employment stimulated by the construction process could easily double the $14 million average, resulting in a total payroll impact on the region of $30 million per year on the average and as much as $50 million to $60 million per year at the peak of the construction process.

Some construction workers and many secondary workers are likely to be hired from local labor markets, while those with specialized skills may be recruited from other states. New employment could average 450 people, with secondary employment adding 900 workers on the average.

Payrolls of this size imply substantial opportunities for secondary businesses in the Tri-Cities area. Procurements of concrete, steel, and other material will also pump dollars into the regional economy. Retailers, real estate brokers, and a variety of other service businesses would benefit from the stimulus.

Table 2: Work Force and Budget Estimates for Hanford Repository Project

PROJECT PHASE	WORK FORCE	ANNUAL BUDGET (MILLIONS IN 1987 DOLLARS)
SITE CHARACTERIZATION		
Construction/Engineering		
Year 1	110	44
Year 2	130	94
Operation/Testing		
Year 3	200	69
Year 4	200	49
Year 5	140	47
Year 6	80	33
REPOSITORY		
Construction	450	402
Operation	815	181
Retrieval		16
Backfill		16

SOURCE: U.S. Department of Energy, Office of Civilian Radioactive Waste Management

At the same time, all of those workers and dependents will impose a variety of infrastructure costs. The net cost to state and local governments of providing roads, utility hookups, and schools depends on the skill of state and local government officials in negotiating compensation agreements with the DOE. The DOE compensation is required by the Nuclear Waste Policy Act, but little guidance is given as to how much compensation should be provided. The bigger the compensation payments, the lower the net costs to state and local governments. The compensation payments might even exceed demonstrable costs as a way of compensating the region for future risks and the stigma of hosting a nuclear garbage dump. For example, payments to the host state of $50 million per year during the site characterization and construction phases and $100 million per year during the operational phase have been proposed by Senator Bennett Johnston, chair of the U.S. Senate Energy Committee.

Operating phase impacts. A 28-year period of active operation would follow, and frequent waste shipments would arrive at the repository to be stored underground. During this period, between 500 and 900 workers would be employed, and the facility would have an annual budget of $181 million. Secondary jobs dependent on the project would vary from 1,000 to 1,800. The next 50 years would be a lengthy period of "retrievability," during which access to the waste canisters would be maintained. About 110 workers would be required during this time period.

For most residents of the region surrounding the repository, there would be little measurable impact from the radiation during the operational phase. The materials coming into the repository would be in solid form, shipped in large steel casks. The handling would be done inside shielded buildings. Since the repository will be accessible throughout this phase, there should be no problem in responding to underground problems that might develop. Workers in the repository would receive some incremental exposure to radiation during normal operation, but any increase in cancers due to routine exposure would probably fall within the background noise event category.

Because natural accidents and human errors do happen in both nuclear facilities and underground mines, there is an increased probability of accidents that involve the release of radioactive materials within the repository. Some of this material could escape to the biosphere. The odds of such an event are very low, and the location of the repository and the physical form of the waste suggest that the consequences would be limited to the measurable category.

In the operating phase, the most visible effects of the repository would result from the transportation of spent fuel or other waste forms to the respository—an effect that would be felt outside the reservation's boundaries. Over the 28-year operating period, as many as 802 trains per year, or an average of 2.2 per day, would pass through the region if all the waste were shipped by train. If all shipments were by truck, 6,186 trucks would arrive yearly, an average of about 17 per day. Current DOE plans are to construct a monitored retrievable storage facility in Tennessee to serve as a collection point for spent fuel from all eastern reactors; under this strategy most of the traffic to the repository would be by unit train via Spokane and the Tri-Cities.

A transportation program of this magnitude and duration is bound to result in ordinary traffic accidents. DOE studies suggest that the transportation casks are likely to survive accidents without the possibility of a radiation leak. If this proves true, most of the hazard stems from the increased probability that future Northwesterners will be involved in traffic accidents.

Fiscal impacts on state and local governments are possible despite the DOE's assurances that it will compensate the state for any impacts on local governments. In the event of a large-scale catastrophic accident, the DOE maintains that the Price-Anderson nuclear liability limits would apply to the NRC-licensed site. This means that the department could not be held liable for damages exceeding $665 million. The applicability of Price-Anderson and the federal government's seeming unwillingness to cover damages exceeding $665 million have been major sticking points in the state of Washington's negotiations with the DOE.

Past experience with nuclear power in general and nuclear waste disposal in particular provides little guidance on the likelihood of catastrophic accidents involving repositories. The existing evidence, such as it is, comes from accidents at operating reactors—which pose very different potential hazards than a repository.

The 1979 meltdown at the Three Mile Island reactor in Pennsylvania resulted in the release of radioactive gases from the plant. The state's governor, who needed to respond to the intense publicity but lacked conclusive information on the health hazards, suggested a voluntary evacuation of the area, and a substantial proportion of the residents of surrounding counties left their homes for several days. Damage to local businesses and costs to local and state governments have been estimated at $10 million and upward, in addition to the increased power costs for all customers of the utility. While very real costs were incurred, all impacts other than the doubled electric bills seem to have subsided within a week, and no long-term impacts on the economic development of the region are apparent.

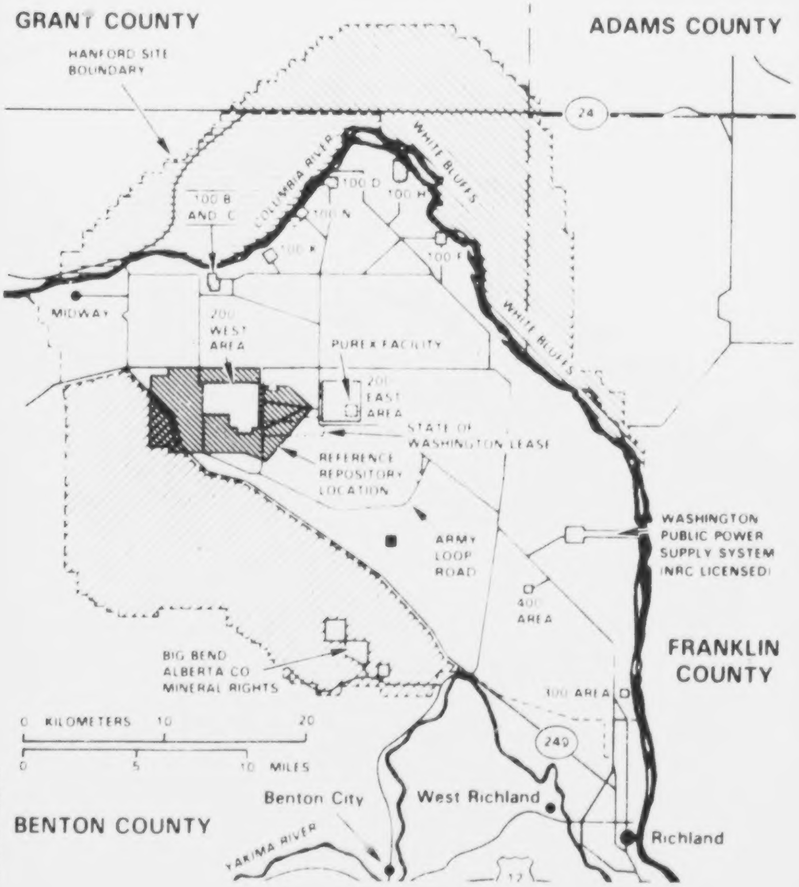
The far more serious incident at Chernobyl in the summer of 1986 resulted in the loss of at least 28 lives and periods of hospitalization for over 200 individuals, the permanent relocation of several thousand residents due to serious to moderate contamination of the soil surrounding the site, and the permanent closure of the affected reactor. Substantial ambient radiation increases were recorded (and reported) in Western Europe, resulting in economic losses to farmers in several countries. Comprehensive studies of the economic impacts of the accident are not yet available. The extent of the long-term land use impact is not known. The ultimate health consequences may affect thousands of people who will face increased risks of cancer 20 to 30 years from now.

Both of these incidents involved control-system malfunctions in operating reactors. In both cases, operator errors compounded or even initiated the accident sequence. There is little possibility for a similar accident in the waste disposal sequence. Fuel will arrive at the repository in solid form in sealed casks. If a given cask should somehow be damaged at the site, only a few tens or hundreds of fuel rods would be involved, with few, if any, opportunities for other casks to become part of the incident. No serious accidents involving fresh or spent fuel rods have occurred in the nuclear industry to date.

Most impacts of the operating repository are likely to be in the background noise category, with some potential for measurable impacts due to unusual natural events or human errors. Even these more serious events are likely to be of a scale and severity that is smaller than the most serious accidents at operating reactors. The very presence of a repository, however, will probably increase public apprehension and may impose a stigma on the region that could affect the willingness of new businesses to locate in the area and the ability of existing firms to recruit new workers. At the same time, a number of measurable consequences of the repository would be very positive for the host region: well-paying jobs, procurement of supplies from local businesses, consistent attention to the quality and safety of transportation systems, and compensation payments from the DOE to the host state and local communities.

The serious, large-scale risks associated with a repository program do not occur during the operational phase. These risks are reserved for the more problematic postclosure phase.

Postclosure Impacts. In the postclosure period, the repository would be backfilled



RANDALL HUNTING

and sealed, a process that would employ a work force of 200. A much smaller work force would then monitor the site indefinitely to ensure that unanticipated events do not occur and to lead response efforts in an emergency. Just how long an active monitoring program would continue is unclear, and the length of the monitoring period will be subject to decisions decades into the future.

Stigma. The stigma of hosting the nation's nuclear garbage dump is an impact that started with the site characterization phase and will increase dramatically with the first emplacement of spent fuel in a repository. Even if no objective threat to the Columbia River or the foodstuffs grown in the Hanford area can be demonstrated, consumers may shy away from Northwestern products because of the dread quality of nuclear waste. If the area's agricultural products are discriminated against on this basis, any benefit from the repository could easily be outweighed by the cost to the agricultural industry. Similarly, if manufacturers decline to site plants in the Northwest because of the stigma of the repository, this could offset the economic benefits of the facility. These risks are very difficult to assess in advance.

Stigma is a self-fulfilling impact; its existence is real to the degree that people say it is and act on it. Accidents at operating facilities do not provide clear-cut evidence for stigma effects. Several studies of the potential long-term impacts on economic development near the Three Mile Island plant have revealed no evidence of such impacts. The more serious Chernobyl disaster, however, led the Soviet government to relocate thousands of villagers and to make compensation payments to individuals. In the United States, public concern over the possibility of a nuclear disaster will create a stigma for the repository's host region—the unknown factor is the strength of that stigma.

Low probability catastrophes. During the postclosure period, the spent fuel buried deep underground will be subject to a variety of threats. The hot fuel casks will tend to attract underground water, which, over hundreds of years, could lead to the corrosion of the casks and fuel. Geologic movement of the underground strata could rupture fuel packages. If the packages were unsealed through corrosion or physical rupture, water could transport radioactive materials toward aquifers or aboveground rivers. The storage system is supposed to be designed so that engineered barriers, such as buried casks and other man-made barriers, will survive for at least 1,000 years, and geological barriers, such as the surrounding rock, will prevent any measurable release of radioactive materials for 10,000 years. Despite the best efforts of engineers to foresee potential problems and to site the repository and design the fuel packages to eliminate such risks, the sheer amount of time that the radioactive elements will sit in the repository raises concern that something will ultimately go wrong—something that will result in measurable or catastrophic damage to the biosphere.

The longevity issue increases the dread quality of a repository and decreases the experts' ability to predict potential problems and design solutions to their consequences. While the experts rate these potential catastrophes as having minuscule risk due to their extremely low probability of occurrence, much of the public apprehension about a repository stems from the magnitude of the conceivable consequences.

Adding It All Up

Based on our qualitative summaries of potential impacts, most of the benefits of the nuclear waste repository occur early in its lifetime in the form of payrolls, procurements, and compensation payments related to the construction and operation of a large facility. The largest potential costs, other than transportation, occur in later years. Both the clear-cut potential for economic damage and the public's dread or apprehension are likely to be focused on the postclosure millennium. The repository's host state will be forced to take a gamble—a gamble that involves certain benefits for current residents and uncertain, potentially huge, costs decades or centuries later.

Standard benefit-cost analysis, particularly the notion of discounting future benefits and costs, becomes inappropriate once completely different generations are involved in the allocation of benefits and costs. Risk analyses and studies of public risk perception help to interpret political and economic reactions to the repository siting process, but do little to show the relative advantages of one site over another. Thus, while all three evaluative frameworks are useful in understanding ongoing political and economic phenomena, they are of little aid in the actual decision of where to put a repository. DOE officials seem to believe that scientific investigations will identify more than one technically acceptable site for a repository, which indicates that neither "hard science" nor social science will dictate a clear preference among potential sites.

The remaining avenues for choosing a site include an overtly political process. Alternatively, the DOE could request bids from the potential host states and then accept the bid that requires the least compensation for taking on the repository. Whether any state would bid on such a venture is an interesting question, but voluntary bidding processes have worked for less consequential facilities, such as prisons.

A repository operation's potential consequences and their associated probabilities are poorly understood at the present time. One of the goals of the DOE site characterization program is to improve our level of understanding. With DOE funding, contractors have been hired by the state of Washington to conduct investigations independent of the DOE. Citizen groups and academics as well will be studying and talking about the repository program. With the ongoing and future analyses and the three types of evaluative frameworks used in this article, the public can become better equipped to understand and participate in the continuing debate over where to put our nation's nuclear waste.

Sources of Additional Information

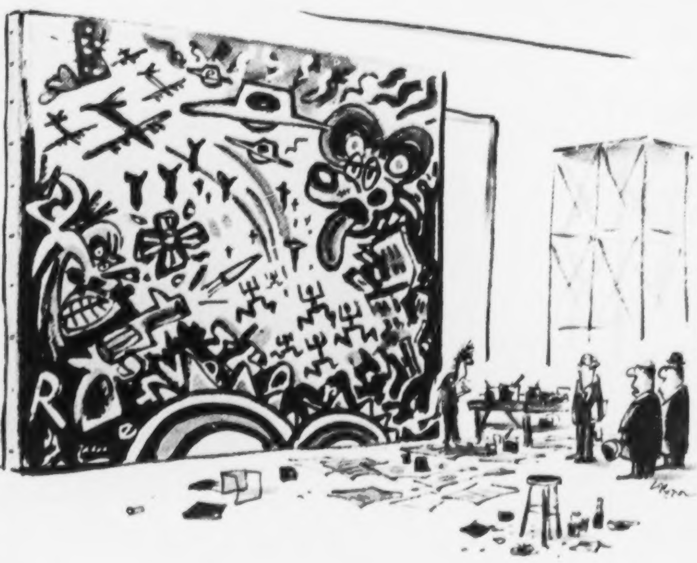
For information about the repository program, readers should consult the following documents:

- Dunford, R.W. et al. **Risk of Economic Loss Due to Failure or Perceived Failure of a High-level Nuclear Waste Repository**. Report for Washington State Institute for Public Policy by Department of Agricultural Economics, Washington State University, Pullman, July 31, 1986.
- U.S. Department of Energy. **Draft Mission Plan Amendment**. Office of Civilian Radioactive Waste Management, Washington, D.C., January 1987.
- U.S. Department of Energy. **Mission Plan for the Civilian Radioactive Waste Management Program**. Office of Civilian Radioactive Waste Management, Washington, D.C., July 1985.
- U.S. Department of Energy. **Draft Environmental Assessment on Reference Repository Location Hanford Site, Washington**. Office of Civilian Radioactive Waste Management, Washington, D.C., DOE/RW-0017, 1984.
- Washington State Institute for Public Policy. **Nuclear Waste: Perspective, Risks and Alternatives**. The Evergreen State College, Olympia, January 1987.

CORPORATE ART:

by Andrew Himes

Art and business might seem a strange, almost contradictory, combination. Artists, after all, are associated with the exploration of the unconscious and the search for meaning and beauty. In business, on the other hand, pragmatism is highly regarded and a sober assessment of reality is demanded. When business decisions are made, a solid grasp of the importance of the bottom line is essential.



"Powerful, but does it say executive dining room?"

Drawing by Lorenz; ©1986 The New Yorker Magazine, Inc.

Ironically, buyers for corporate art collections represent the single most potent factor in the booming art market of the 1980s. Modern corporations are the Medicis of the 20th century, acting both as patrons and as investors. The result has been an influx of money into the art market and an influx of art into corporate settings.

Corporations may buy art as part of a public relations program, as a financial investment, or because empty walls demand decoration. They may buy art to support artists or to provide a more stimulating working environment for their employees. Sometimes they may just buy art because they enjoy art and want to have it around. Whatever the motivation, the phenomenon of corporate art collecting has problematic effects. Corporate collections may be privately owned, but together they affect the public by adding to the inflationary pressures in the art market as a whole and by influencing the prices of individual works of art. By driving up prices, corporate demand has also had an adverse effect on the acquisition budgets and policies of museums.

Corporate art buyers influence the type of art that is created. They sanction and finance relatively safe, conservative art, a genre that could almost be called "corporation art." Their buying policies tend to discourage art that provokes or disturbs, promotes controversy, or challenges established ways of perceiving the world.

When a corporation places a sculpture or

BOON OR BANE?

painting from its collection on public display, the artwork tends to become something more than just a possession of the corporation. It becomes a part of the cityscape, an element in the life of the community. If a corporation decides to move or otherwise dispose of a popular, well-known, publicly placed artwork, it risks public censure or, at the least, an investigation of its motives.

Why Purchase Art?

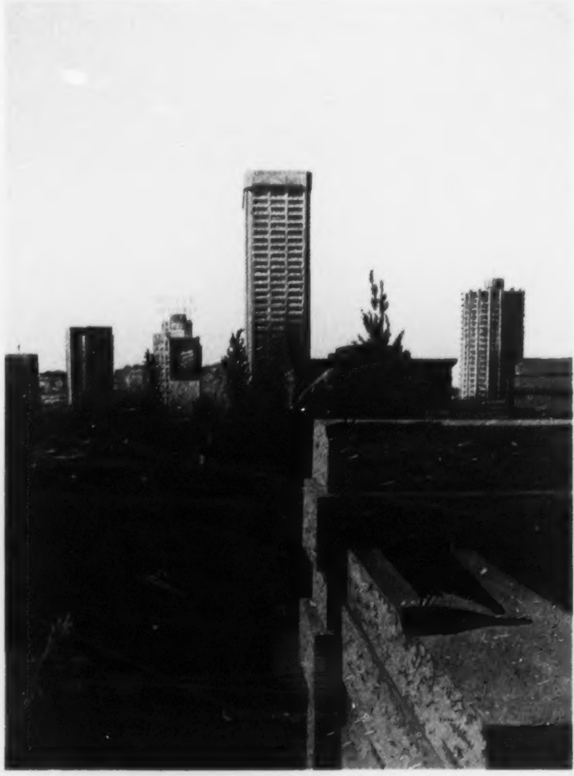
In the last 15 years, corporate art collecting has increased significantly in size, quality, and ambition. In the early 1970s, few Northwest corporations could claim to possess what could be called a collection of art. Most selected paintings and sculpture with the same criteria they reserved for picking out wallpaper or deciding on the right carpet texture—the overriding considerations were decorative. Although this is still true in many organizations, corporate sensitivity to the value of art both as an investment and as a public relations tool has dramatically increased.

Corporations have come to believe that whether a company possesses works of art has something to say about its collective identity, its style and aspirations, and its corporate self-image. This theory is eloquently expressed by Seattle-based corporate art consultant Irene Mahler: "A corporate art collection is a statement that this company cares about quality and creativity. It reflects the vision, the vitality, and the sensibilities of the corporation and represents an effort to bring richness and pleasure to the entire community."

Chuck Katz, an attorney who earned a master's degree in art history along with his LLD, is the curator and guiding spirit behind the art collection of Perkins Coie, the largest law firm in the Pacific Northwest. He has a simpler, less philosophical point of view. "We buy art because we like art," says Katz. Perkins Coie is noted for the high quality and diverse character of its collection, which appears in the hallways, conference rooms, and waiting areas of its offices.

"Our goal is to introduce people to some of the finest art available," Katz says, "but there's a cynical side to it as well. In the corporate world, there is pressure to buy art; if you don't, you must be a troglodyte. If you want to be seen as ambitious, you will have a painting on the wall. So art prices go up, and a certain kind of art gets ratified and encouraged."

Greg Kucera, owner of Kucera Gallery in downtown Seattle, believes that many corporate art-buying decisions are made by people who have a limited art education—if any at all. "Many corporations buy art as their way of participating in the community," says Kucera. "They patronize the arts and support local artists and see art as a good investment. Whatever the limitations of that view, at least I prefer it to just buying art to have pretty things in the office. But the fact is, many decisions about what to buy are made by people who never even visit the galleries and know little about art."



EDUARDO CALDERON / COLLECTION OF PACIFIC NORTHWEST BELL

Gertrude Pacific's *Crowbear Park*, an acrylics on canvas painting, shows what the Canadian-born artist calls Seattle's "oyster gray skies" and the city's unusual "oyster light."

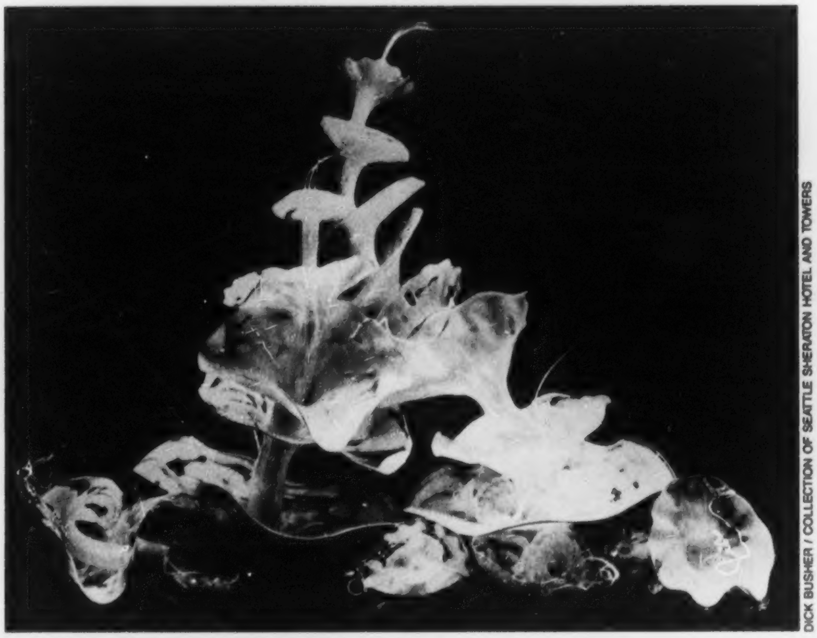
Lee Whitecar, the professional curator of Pacific Northwest Bell's (PNB) collection, is an exception to Kucera's generalization. PNB began collecting when it opened its new corporate headquarters building in 1976, and the company has gained a reputation for its emphasis on artists and art indigenous to the Northwest. The collection includes works by the major, well-known artists of the Northwest and by the younger, less well known, emerging artists. Whitecar explains that PNB values that vital, interactive connection it has established by supporting living artists.

PNB's art-buying program is also strongly tied to the corporation's view of good public relations. "Sure, we want our public image to be that of a company concerned about the community and the arts," says Whitecar. "Our commitment has grown steadily in the years since the phone company's divestiture. The change from a monopolistic, regulated situation to a competitive one has forced a major change in how we do business. We care about how people think of us and see supporting the visual arts as part of our overall relationship to the community."

Self-Interest Versus the Public Interest

For artists, galleries, and the art-conscious public, corporate participation in the art market is a mixed blessing. It is axiomatic that artists and arts organizations are chronically short of money, so most artists welcome the prospect of a positive cashflow. It is also true, however, that money is influential and has an impact in the art world. Whether corporations seek to create such change or influence is irrelevant. The point is that they do, and their power to do so carries with it a corresponding responsibility—to artists, to galleries, to the culture in which they live, and ultimately to themselves.

"We are a corporate citizen," says PNB's Whitecar, "and we're trying to understand what that means. Frankly, a corporation doesn't have to do anything but make money, but if that's as far as your vision goes, you can't be viable. When you invest in the community, you invest in the corporation as well—in its health and vitality. We serve the Northwest so we feel we should support the artists of the Northwest. When PNB began this collection, the idea was not just to give money to the arts, but to become involved in the art community and to support artists both by buying their art and by providing a place for it to be shown."



DICK BUSHER / COLLECTION OF SEATTLE SHERATON HOTEL AND TOWERS

Dale Chihuly, the creator of *Flower Form, 2, 1985-86,* is an international leader in the studio glass movement and is only the third American to exhibit at the Louvre.

Chuck Katz of Perkins Coie discounts the claims of higher motivation that he hears from his fellow corporate curators. "You can talk about being a corporate citizen with an obligation to support the arts, but you collect art because it's good business," he says. Unlike PNB's Whitecar, Katz separates his firm's collection of art from its role as a corporate citizen. "We take part in the United Fund and other charitable efforts of the business community, but good citizenship has nothing to do with why we collect art," says Katz. "To be blunt about it, we're basically selfish. We work hard and have to spend a lot of time here. Why not have some fine art to look at?

"We do try to have a healthy relationship with the local arts community," Katz concedes. "Although we make purchases in New York and San Francisco, we buy a lot of work from Northwest artists and are very careful not to undercut the galleries. Most successful artists are represented by galleries, and when an artist has a relationship with a gallery, we'll always buy through the gallery."

The Effects of Corporate Buying

The inflationary effect on prices paid by companies for works of art is not the most important—or the most insidious—effect of corporate participation in the art market. It would be remarkable if the amount of money corporations spend on art did not also have an impact on the kind of art being produced. Many corporations begin collecting art when they are expanding and taking on additional space, often ending up with a kind of institutional art. Chosen for decorative reasons by a committee, this "art" is noted for its boring, compromised quality.

Gallery owner Kucera agrees that corporations have significantly altered the art market. While the effect has not been uniformly negative, the results have at best been mixed. "Architecture of the last 30 years has allowed for larger spaces for artworks and larger pieces," says Kucera. "At the same time, the influx of corporate money into the market has encouraged a certain kind of horizontal and unemotional art that's safe and predictable. People who believe that a company spends its money wisely may conclude that an artist exhibited by a corporation is a good investment. The result is that there are people who make safe, unexceptional art and get recognized for it."

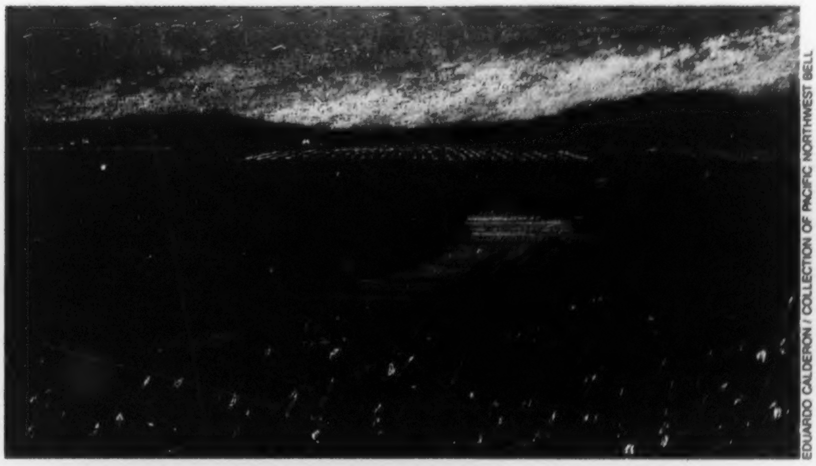
Kucera sees the surge in corporate collecting in the last 20 years as part of a growing nationwide trend toward the commercialization of art. "There has been a proliferation of galleries, and the phenomenon of 'name-brand artists.' One day an unknown artist is working in obscure poverty, and the next day he or she is famous and wealthy. It's what a critic for the *New York Times* called 'the art of the next 15 minutes.'"

The "investment mentality" guides many corporations' decisions about buying art. Works of art are purchased as a result of financial calculations about what kind of art—or which artist's work—will rise in value, rather than for aesthetic reasons. A corporation that buys art for investment purposes may realize a profit, but could also be left holding work by an artist who was a hot market commodity yesterday but has fallen from favor today, leaving his "investors" high and dry.

The same investment mentality will lead a corporation to withdraw from the market when it perceives a diminishing number of tangible benefits from buying art. The tough economic times of the last few years in the Northwest, for example, have taken their toll on corporate allocations for the visual arts. Art is viewed as a luxury by many corporations and is often cut from the budget when things get tight.

"Disturbing" Art

Art has a peculiar effect on people. It can make us laugh or cry; it can make us angry or give pleasure. A painting on a wall can be a helpful, relaxing distraction in the middle of a day full of tension and frustration.



EDUARDO CALDERON / COLLECTION OF PACIFIC NORTHWEST BELL

Richard Gilkey captures the colors of the Skagit Valley in *Skagit Iris Fields*, an oil on hardboard and linen painting. Every major collection in the Northwest contains at least one Gilkey work.

A sculpture can shock us into perceiving reality in a wholly new way or make us question our most commonplace assumptions. In an almost magical way, a work of art can help us deal with grief, enable us to communicate with another person, or encourage us to find fresh, creative solutions to problems.

Why does one company buy safe, conventional, principally decorative art while another goes after fine, quality art? The real difference is in the education of the people who make decisions for the company. If those who buy art understand its importance and what it can do, they are more likely to buy art of quality.

Although most corporations make relatively cautious purchases, Greg Kucera contends that the result does not have to be boring, purely decorative art. He maintains that corporations can afford to be bold and innovative when they purchase art; they can go after the new and experimental. In addition to encouraging younger, less well known artists, purchases of innovative art are cheaper and easier on the budget.

PNB's Whitecar agrees in principle, but also says that his company has historically been fairly conservative. "You won't find political statements in our collection or nudity. There have been a number of times when I wanted to buy a particular work and I didn't. I am willing to take chances, to jolt people, and to stretch their horizons, but I am operating in a corporate context, and I have to consider others besides myself. Although I am in favor of having disturbing art, art that unsettles people, I won't buy offensive art. The difference lies in the intent of the artist."

Chuck Katz is also careful about the line between his desire to be provocative and disturbing and his opinion as to what constitutes good art. Some art, he believes, can be inappropriate in a corporate setting and can infringe on people's rights. He maintains that there is a crucial distinction between encouraging a certain conservatism in subject matter and encouraging conservatism in the medium itself.

Building a Good Collection

Developing a good corporate art collection is a process that requires care and patience, long-term planning, a love of art, and an understanding of what constitutes good art. The best corporate collections, according to Greg Kucera, are assembled by just one or two people who know what they are doing and have some real expertise, instead of by a big committee that may include several people who know little or nothing about art. He also feels that a company that does not have that kind of expertise in-house should hire an outside consultant.

A significant number of collections are begun when the organization is moving to new offices and the question of how to decorate arises. In such cases, Kucera advises hiring an art consultant before hiring an architect and having them work together. This is an opportunity to develop a long-term strategy for collecting. By creating specific spaces for the art to be shown and commissioning pieces for larger, more public spaces, a corporation can acquire the work of artists it would like to support.

There is no correct way or even best way to design a collection. Many corporations organize thematic collections by concentrating on fiber art, fine art photography, seascapes, or glass art. PNB and several other Northwest corporations have specialized in contemporary Northwest painters. A number of other collections have no special focus.

"Most of all," Kucera advises, "seek quality and fine art. When you are building a collection, what matters most is that you have someone making the decisions who cares deeply about art. You need someone who conceives of art as a collection and not just as a series of decorations."

Consultant Irene Mahler agrees. "I tell people to look for a work of substance and quality, one that makes a statement," she says. "You are not just buying something to decorate the walls with. You are buying what will be a living, vital part of the environment. Look for talent and good art, and the character and quality of your investment will take care of itself. You can't really speculate on the long-term value of a work of fine art."

There is a significant distinction between a collection of art and an assortment of decorations or a set of office ornaments. The difference begins with what the collector knows about art and what his or her motivation is. Corporations should acquire art for the same reason a private owner does—because of a passion for and a desire to learn about and be stimulated by art. As Greg Kucera says, "A corporate collection should strive to include art of quality and conscience that mirrors our society and says something important about the world. It should encompass art that will stand up in 20 or 30 years and be the equivalent in quality to a museum collection."

Andrew Himes is a freelance writer based in Seattle.

Washington's Fishing Industry

A PATTERN OF CHANGE IN THE NORTH PACIFIC

by William H. MacKenzie

"Timing is critical in the fishing business," said Rudy Peterson, who has spent 38 years on fishing boats in one capacity or another. In the late 1970s he owned five crab boats, but has since sold them. "Fisheries are cyclic and it seemed to me that with all the boats getting into the king crab fishery off Alaska, things were getting out of hand," he added.

From an office just a short walk from one of America's busiest fishing ports, Seattle's Fishermen's Terminal, Peterson now manages four vessels. He owns a catcher-processor and a trawler and co-owns two other trawlers. In addition, he is converting a recently purchased vessel into a catcher-processor. By anticipating and changing to adapt to the times, Peterson provides an example of what is happening with the commercial fishing industry in Washington State.

The Scope of the Fishery

From 1981 to 1985, about 6,500 boats licensed in Washington harvested an average of 150.7 million pounds of fish annually from the Puget Sound and Pacific coastal waters of the state. In 1985 another 1,371 Washington-based vessels harvested 2.1 billion pounds of fish in distant-water fisheries, principally off Alaska. Of that distant-water harvest, about 1.6 billion pounds were delivered to foreign vessels at sea in joint venture arrangements. Natural Resource Consultants of Seattle estimates that fishing and processing generated direct and indirect economic benefits to Washington valued at $1.1 billion in 1985.

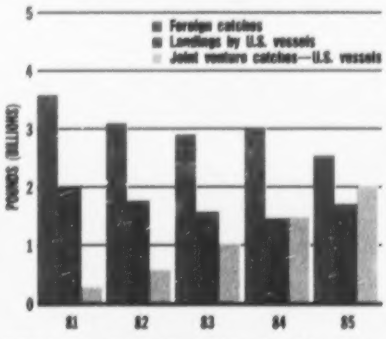
Editor's note: This article is a companion piece to "The Decline of the Alaskan King Crab Fishery: A Regional Resource Industry in Transition," which was written by Jeffrey Hanson and Scott Matulich and appeared in the April 1987 issue of Pacific Northwest Executive. *Together, the two articles present an overview of the past, present, and future of the North Pacific's fishing industry.*

March 1, 1987 was the 10th anniversary of the Magnuson Fishery Conservation and Management Act (MFCMA), the extension of U.S. fishery jurisdiction to 200 miles offshore. In the past 10 years, the U.S. fishing industry has undergone some of the biggest changes in its history. Nowhere have those changes been as dramatic as in the North Pacific, and there have been no bigger players in those changes than the fishing industry entrepreneurs of Washington State.

Until March 1, 1977, the U.S. fisheries jurisdiction (federal and state) extended only to a 12-mile zone off U.S. coasts. U.S. harvests beyond the 12-mile limit were minuscule in comparison with the foreign take. While U.S. vessels harvested only 598 million pounds of fish beyond 12 miles in 1976, as many as 2,700 foreign fishing vessels extracted 5.1 billion pounds of fish from those same waters.

Now the situation is clearly reversed. In 1985 the foreign catch in waters off the United States beyond state jurisdiction (in the 3- to 200-mile federal Exclusive Economic Zone) totaled 2.6 billion pounds and the domestic catch totaled 3.7 billion pounds. Foreigners are restricted to the allowable catch that U.S. vessels will not take. The December 1986 recommendation of the North Pacific Fishery Management Council, the government and industry body set up to manage fisheries in the Exclusive Economic Zone off Alaska, that the 1987 allocation to foreign fleets be only 1.2 million pounds may signal that the end is near for the foreign fleets. This allocation, if approved, would include a zero allocation in the Gulf of Alaska. Foreign catches off Alaska totaled almost 1.4 billion pounds in 1986. With the U.S. catch growing so rapidly, many observers predict a total displacement of the direct foreign fisheries in the North Pacific within the next three years—a prediction based on the domestic industry's enthusiasm for innovation.

Figure 1: Commercial Catches in the United States, Exclusive Economic Zone, 1981–1985



SOURCE: *Fisheries of the United States, 1985*, National Marine Fisheries Service

Delivery of U.S.-caught fish to foreign processing vessels at sea under a variety of joint ventures (JVs) has been one of those innovations. These JVs range from simple, over-the-side sales under negotiated contracts to equity-sharing, U.S.-foreign partnerships. The first North Pacific JV at-sea delivery took place in 1978, when 2 million pounds of Pacific whiting were delivered to two Soviet freezer-trawlers. In the years that followed, JVs off the Pacific Coast and Alaska were initiated with the Republic of Korea, Japan, Bulgaria, the Federal Republic of Germany, Greece, Portugal, Spain, Taiwan, and Poland.

By 1985 joint venture deliveries in the North Pacific totaled 2 billion pounds (see Figure 1). Eighty-one Washington-based trawlers, which delivered 1.6 billion pounds of this total, were paid $78.9 million for their work. This made JV deliveries, which were nonexistent 10 years ago, Washington State's second largest harvest in value, exceeded only by the state's $217.6 million salmon harvest.

The Next Step: Factory Trawlers

The joint ventures have not only helped a lot of Washington's fleet survive, but they have allowed the fleet to gain the expertise needed to replace the direct foreign fisheries. In a sense, the JVs' very success may have signaled their demise. Since the U.S. industry has proven its ability to harvest the distant waters of the North Pacific, it is now

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Walter Pereyra

moving into capturing the processing end as well by developing an integrated, at-sea, harvesting-processing capability using mostly Washington-based factory trawlers.

There were no Washington-based factory trawlers (vessels that harvest and process fish at sea) when the MFCMA went into effect. By 1985 the Washington-based factory trawler fleet numbered 12 vessels of up to 300 feet with a capitalized value estimated at more than $77 million. Together these vessels processed 248 million pounds of fish with a wholesale value of $61.2 million. According to Ted Evans, executive director of the Seattle-based Alaska Factory Trawlers Association, by the end of 1986 this had grown to 20 vessels processing 330 million pounds of fish with a wholesale value of roughly $130 million. Evans expects 5 to 10 more factory trawlers to come on line in 1987.

The growth of this sector of the industry has been phenomenal. Even with its considerable recent success, however, the factory trawler fleet still took only 17 percent of the bottomfish harvested by trawlers off the North Pacific coast in 1985. The balance of the available harvest offers substantial opportunity for a dynamic domestic fishing industry.

Despite the passage of the MFCMA, which gives first preference to fish in the 200-mile zone to U.S. fishermen, the prognosis for the U.S. fishing industry not too long ago was far from a hopeful one. After an initial period of growing expectations and overbuilding of vessels, industry and government officials found themselves attempting to come to grips with a troubled industry—one that some pessimistic analysts portrayed as on its last legs without massive government intervention. This cyclical industry in the Northwest is recovering, however, with the survivors of the tough times laying the foundation for an altered, but prosperous, industry in the future.

Many of those survivors have adapted to the collapse of the Alaskan king crab fishery in the early 1980s by shifting into joint venture trawling. Now, as JV operators grow more wary about the future of their agreements, the money generated by JVs is being used to finance the conversion of old vessels into factory trawlers or the construction of new ones.

Growing Pains

This transition to U.S. harvesting and processing of the entire range of North Pacific fishery resources is, however, generating some new problems. U.S. shoreside processors operating principally in Alaska are concerned that the at-sea processing operations, largely on vessels based in Washington, will drain away their supply of fish and threaten their viability. Some processors are trying to prevent this by pushing for time and area restrictions on U.S. factory trawler operations and prohibitions on the transfer of foreign-built processing ships to the U.S. flag. Alaskans prefer to have fish from their coastal waters processed at Alaskan plants that employ Alaskan workers, both of which pay taxes to Alaska.

Another increasingly contentious issue is the proper role of the state of Alaska in the management of fisheries in the federal Exclusive Economic Zone off its coast. Although the MFCMA requires that conservation and management measures not discriminate among residents of different states, Washington-based fishing vessel owners, with more than 90 percent of their catch coming from Alaskan waters, are fearful of Alaskan control of the fisheries. Alaskan interests argue, on the other hand, that if the state is to devote its financial resources to the management of a fishery, it should be able to carry out that management without excessive federal interference. The state's position is enhanced by the sympathy it receives from the North Pacific Fishery Management Council, which has an Alaska majority of voting members.

One group opposed to the idea of Alaskan management extending beyond three miles is the North Pacific Fishing Vessel Owners Association (NPFVOA), which represents Washington-based crabbers and trawlers.

The NPFVOA fears that short seasons, pot limits, the simultaneous opening of different fishing areas so that vessels cannot fish one area after another, exclusive registration zones limiting a vessel to operating only in certain areas, and other conservation measures will be used by Alaska to the detriment of large vessels from outside that state. It also fears that unsubstantiated claims regarding the impact of trawling on crab stocks will be used to justify unreasonable curtailment of Washington-based trawlers within the fishing areas managed by the state of Alaska.

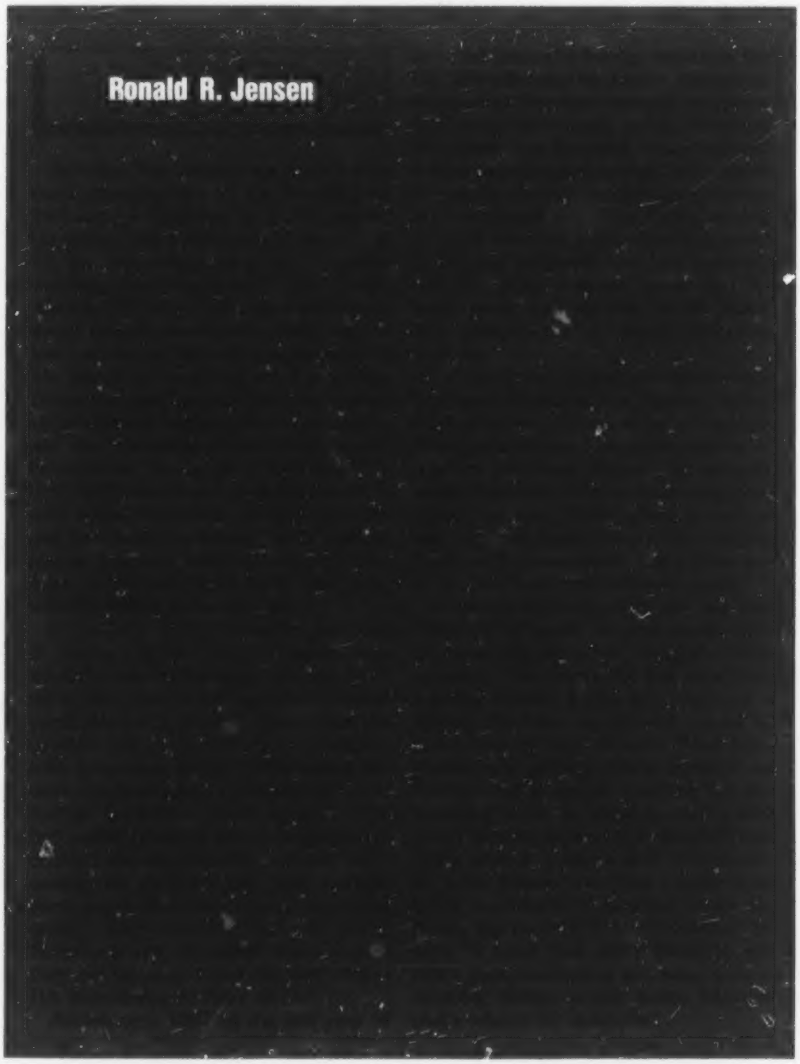
This is related to another problem: the conflicts between different gear types as a result of the growing U.S. bottomfish industry. Crab vessels, which use stationary pots, and trawlers, which drag bottom nets, find it difficult to operate on the same grounds at the same time. The U.S. industry is finding that in many respects it was much easier to impose restrictions on foreign trawlers than to decide how to handle conflicts among U.S. fishing groups. The NPFVOA, for example, is facing a splintering of its organization as different factions feel they need specialized representation. The association has already spawned a separate group of Washington-based factory trawlers (the Alaska Factory Trawlers) and another group of crabbers (the Alaska Crab Coalition) that fish primarily off Alaska.

Future Prospects

Though these conflicts may be troublesome, it is unlikely that they will halt the growth of the U.S. bottomfish industry in the North Pacific. That fishery, which was almost nonexistent a few years ago, already produces an extensive amount of fillets and headed and gutted bottomfish and is starting to produce what promises to be its most successful product, surimi. Most often seen in America as a crabmeat substitute, surimi is a blended seafood product that already enjoys tremendous popularity in Japan. With a growing U.S. market, its future looks promising.

There is the possibility that a shift in the value of the dollar or the condition of fish stocks will again cloud the future. Also, the industry's good fortunes may again be tempered by an overbuilding of vessels until profits are spread too thin for the fisheries to be workable. Such overbuilding would likely result in new calls for limiting entry into the fisheries or assigning private rights to areas or shares of the fishery resources.

The industry could also find itself engaged in internecine warfare as a consequence of the shifts in fishing activities and the resulting fragmentation of the industry. Single-purpose industry groups could find their members splitting off to form associations that better represent their new activities. This fragmentation could, in turn, weaken the industry's influence at the state and national levels. It could also diminish the industry's ability to prevent fishing ports from being turned into expensive condominium developments, to stop the destruction of valuable fish-nurturing wetlands and the loss of salmon streams by improper land use practices, to fight against foreign tariff and nontariff barriers to the import of U.S. fisheries products, and to stop the diversion of money from fisheries research and management to other purposes.


Ronald R. Jensen

It could also be that the apparent fragmentation of the industry is simply a realignment signaling the emergence of new coalitions and leaders reflecting a healthier, though different, industry. Whichever is the case, the Washington-based fishing industry is sure to be in the forefront of changes that alter the stereotype of fishermen as quaint fellows swapping sea stories in picturesque wooden boats. Fishermen are, instead, sophisticated entrepreneurs who are part of a multi-million dollar industry and who make decisions that play a significant part in the economic well-being of the state.

William MacKenzie writes on business and politics. He served as counsel to the Subcommittee on Fisheries and Wildlife Conservation and the Environment of the U.S. House of Representatives from 1983 to 1985.

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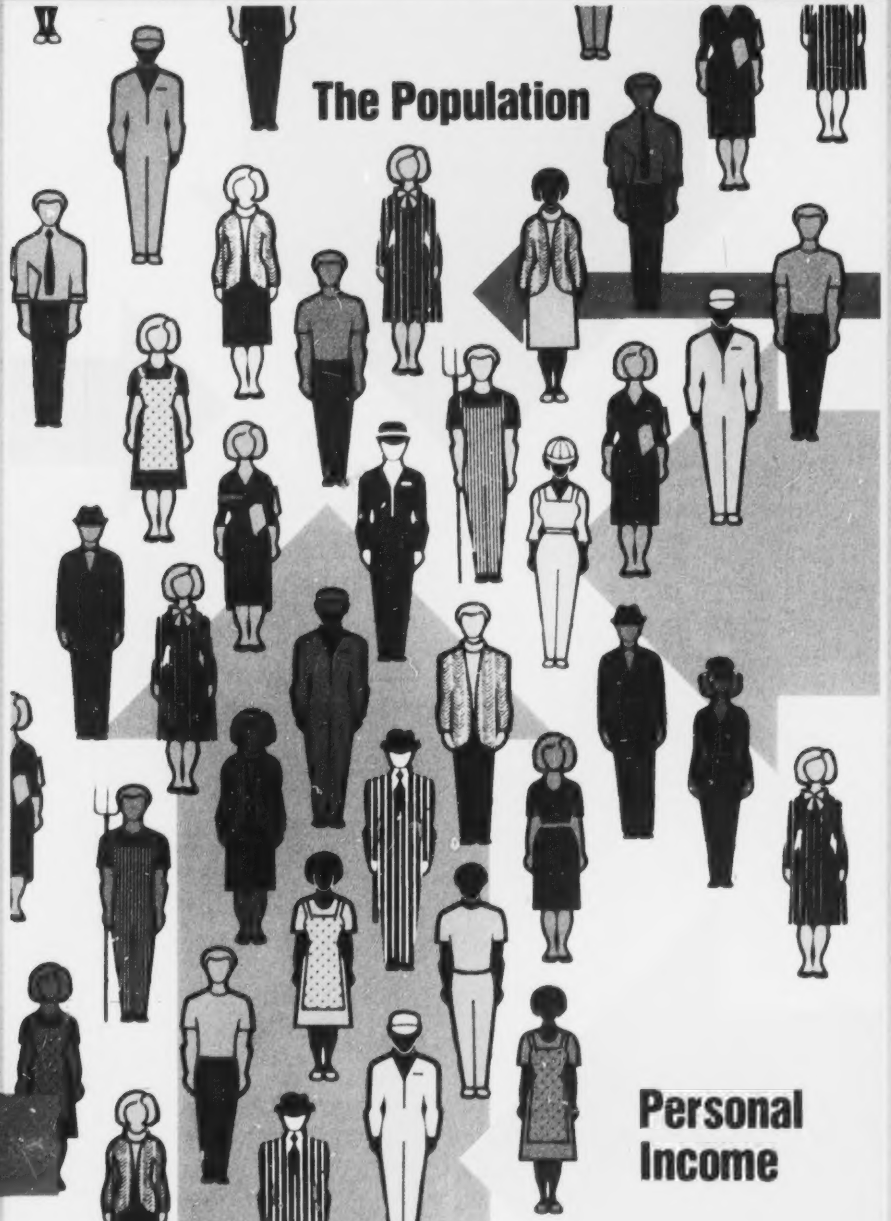


Environmental Control: The Adolescent Stage

REGIONWATCH

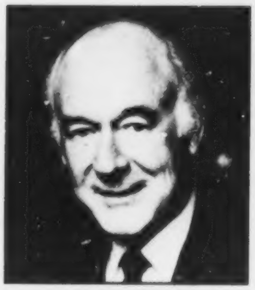
- The Changing Agricultural Landscape
- Agricultural Production Indicators
- Heating System Economics

The Washington Circular Flow Model

BPA: What's Next?

Commentary

Energizing the Northwest: Power and Economic Revitalization



When we talk about economic development, we are really talking about the future of the Pacific Northwest. The questions those of us in positions of public trust must continue to ask about this issue are fundamental: What kind of economy will we have in 10 or 20 or 50 years? Will the regional standard of living improve, or will our children and grandchildren inherit a lifestyle that is less than what any of us want to leave them? And what will the future cost us?

In a recent speech to a Bonneville Power Administration seminar in Portland, I suggested ideas that I'm convinced we must keep in mind as we move to enhance the region's economy and to capitalize on the unique benefits we have in the Pacific Northwest. We must never forget, for example, that the single biggest catalyst for economic development is our tremendous energy system, the Bonneville Power system. In 1932 Franklin Roosevelt stated: "This vast water power can be of incalculable value to this whole section of the country. It means cheap manufacturing production, economy and comfort on the farm and in the household."

The prime Bonneville mission, in the 1930s and today, is to develop the region's economy. I appreciate the support the BPA is giving me and my colleagues—Booth Gardner, Ted Schwinden, and Neil Goldschmidt—as we all attempt to expand our economies. Bonneville can be a full partner in our efforts by adhering to its original economic development purpose.

Today, we have a significant electric generating surplus in the Northwest. The surplus is an economic development incentive as great as any we could possibly have. It is the kind of advantage we can profit from, but one we must not squander. In many respects, sending power from the Northwest down the line to California is like sending our Northwest water. Granted, today we're sending electricity, but in the public mind, and in mine, the two are closely linked.

I can argue that, because we have a surplus, it makes perfectly sound economic sense to ship the surplus south. But California must not be allowed to dictate the management, price, and development of the natural resources of the Pacific Northwest. Californians must pay a competitive price for our energy. And when the surplus is gone—as it will be someday—then California slips to the bottom of our priority list.

This should be the principle to guide us in our management: We will market the surplus outside the region if we must, but let's use it here if we can. Every leader in the Pacific Northwest should stand united on this issue. We must put ourselves to work marketing this great tool right here in our own states. We must find ways to create new jobs and build new industries while, at the same time, we help existing businesses and rebuild existing industries.

The challenge to the BPA, and to all of us in the Pacific Northwest, is to continue to find ways to make the surplus available right in our own back yard. And, certainly, our industries should not pay more than California users pay. I strongly urge Bonneville to work with our industries, particularly distressed industries, to use the surplus efficiently.

Our fundamental task is the revitalization of our economy and the retention of our unmatched quality of life. We must get on with it in a spirit of cooperation. FDR's dream of a strong, resilient economy was a good dream in 1932. It's a goal within our grasp today.

Cecil D. Andrus
Governor of Idaho

PACIFIC NORTHWEST Executive

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ILLUSTRATIONS BY JERRY NELSON

The Adolescence of Environmental Control

by Richard Roth

Earth Day, 1970, was the high-water mark of the Age of Innocence of environmentalism. We'll simply mandate clean air and water, said the innocents, and make the polluters pay. Pollution control was a stark morality play, and the deeply felt wish for a pollution-free world fathered marches, demonstrations, and legislation.

The early 1970s gave us the absolutist logic behind both the Clean Air Act and the Clean Water Act, which compelled polluters to install and maintain the "best-available technology," regardless of the demonstrable effects of the pollution abatement and control (PAC) equipment on specific bodies of air and water.

There are now signs that we are entering a painful transition period for environmentalism in the region, an adolescence of sorts, in which wishes aren't easily translatable into action, and all actions have a price tag. Technology-based regulations are not going to disappear as environmentalism in the Northwest ages, but there will be more attention paid to the cost of pollution abatement and control.

These are surely the environmental days of wonder. The $9 billion 1986 Superfund was to finance the Congressionally mandated cleanup of old hazardous waste sites. Public costs for water quality in Washington State are projected at $2 billion between now and 2000, and corporate planners complain that they are being held hostage by regulatory fortunes. As Andrea Riniker, director of the Washington State Department of Ecology sees it, "The mid-1980s have seen the birth of the second stage of environmental activism. We've seen a new surge of concern and interest in Washington, especially in the issues of waste disposal and cleaning up Puget Sound."

Regionally, we have some of the toughest state agencies in the country, some of the most environmentally progressive companies, and some of the highest capital expenses for environmental control equipment for our resource-based industries. Despite this environmental sophistication, there are no ways to reckon what environmental regulation costs private industry, does for specific environments, or might cost in the future.

Economic constraints are forcing both the naiveté of environmental absolutism and the arrogance of corporate resistance to give way to a considerably more complex, more mature approach to environmental control. The question no longer is how to achieve environmental control, but how the economics of environmental control should affect our attitudes and policies. How much has industry spent on pollution control? How much should industry spend? How much more do we need to know about the effects of pollution before we force industry to spend more on pollution control? How much does pollution cost?

There are signs that a turbulent adolescent adjustment to pragmatic considerations is taking place. In the past two years, State Department of Ecology fines have increased threefold, to more than $1 million annually, and the DOE plans to push for criminal sanctions for repeat offenders in the January 1988 legislative session. For the first time, the DOE hopes to come up with a methodology for assessing how effective their PAC regulations and enforcement actions have been on specific environments. In addition, business, trade, and agriculture groups, faced with escalating waste disposal fees and fixed pollution control costs, are trying to control overall PAC costs while they focus the debate on cost-effective pollution reduction. Industries are seeking relief by negotiating for what they see as more realistic permit levels and also by appealing a higher percentage of fines. A coalition of regional businesses and trade groups added a cost-effectiveness mandate and liability and fee caps to a hazardous waste disposal bill in the legislature last spring, but the overladen bill died in committee. Cost-effectiveness arguments have also played a role in the scuttling of a bill that would have increased permit fees for those industries that discharge wastes into the state's waterways.

Regulatory Burdens and Economic Black Holes

Corporations often must report the same pollution control and abatement data to a dozen or more federal, state, county, and regional agencies, departments, and authorities. No one is in charge, and jurisdictions and authorities overlap. Air pollution control may be mandated at the federal level by the Clean Air Act, but it is interpreted and enforced in differing ways by the federal EPA, the state DOE, and regional bodies, such as the Puget Sound Air Quality Control Authority. And EPADOEPSAQCA has no unified front nor does it act as a coalition, so industry reporting is complicated and policies are often negotiated ad hoc.

Not surprisingly, then, there are no state or local estimates of environmental protection costs for the private sector, and the federal government is forced to sort out about six divergent ways of estimating costs and can't offer any definitive figures either. Corporations, too, are reluctant to discuss PAC costs, in part because they don't want to sound like bad environmental actors, because they live in terror of escalating hazardous waste costs and liabilities, and because the costs are not easy to compute.

Pollution Abatement and Control Cost Considerations

Capital Costs

Pollution control equipment
  New equipment
  Modifications of old equipment
Transportation equipment
Changes in production process

Operating and Maintenance Costs

Equipment maintenance
Equipment operations: materials and supplies
Labor
Depreciation of equipment
Equipment leasing
Transportation
Storage

Administrative Costs

Labor: legal
Labor: environmental managers, engineers
Labor: corporate managerial
Labor: clerical
Labor: editorial, operations manuals
Supplies, materials, utilities
Research and development
Permitting fees
Equipment registration fees
Lab tests
Waste transportation fees
Waste storage costs
Waste disposal fees
Court costs
Fines
Liability suits
Staff training and consultants

Given such a volatile, murky, and incredibly expensive scenario, you would expect novelty, innovation, and economic tinkering from all sides to project costs, crank cost-benefit analysis into long-term environmental policy-making, and effect changes in the production process to reduce hazardous wastes before they come out the pipe. Instead, industries, governmental agencies, and lobbies seem to be muddling through, and no one is sure of ends or means.

Pollution abatement and control expenses increase exponentially as levels of attainment approach zero discharge. At the same time, though, pollution levels, and their notoriously hard to quantify costs, drop. So the golden mean is the point at which acceptable controls can be carried out for the lowest possible cost. That need for close cost-benefit assessment is underlined by DOE Director Riniker, who agrees that "cost-effectiveness is the next era of environmental discussion as we move toward these last increments of improvement, that crucial two percent, and decide if they are worth it."

It's fairly certain that the business community will continue to focus the public debate on the economics and pragmatic aspects of PAC costs. One of business's arguments is that environmentalists and the public are ignorant of what the private sector has already spent, and naive in their assumptions that pollution control comes free—when it is actually a zero-sum game or value-added tax.

How Much Have We Spent Since Earth Day?

The most commonly cited figures on the economics of environmentalism in the region are those of the Commerce Department's Bureau of the Census, which are broken down into capital, and operation and maintenance costs. Capital figures include both private and public PAC costs, including the operation and construction of public sewer systems, disposal of solid wastes, and auto emission controls, as well as new plant equipment and other PAC-related construction costs. Operation and maintenance costs do not include transaction costs (administrative overhead, legal fees), waste disposal fees, or research and development expenses, but do include depreciation, labor, materials and supplies, services, and equipment leasing.

Commerce's figures add up to such staggering sums that you can hardly grasp them: between 1972 and 1986, $600 billion to $700 billion (constant 1972 dollars) have been spent on pollution controlling goods and services (Table 1). That's more than Americans spent for food in 1986. Keep in mind, though, that 1970s-style inflation accounts for about half that sum and that PAC spending peaked in the late 1970s, when industry completed the equipment changes needed to comply with the 1971 Clean Air Act and the 1972 Federal Water Pollution Control Act. Pollution abatement and control costs have plateaued since 1981, but skyrocketing waste disposal fees may change that.

The Northwest has, on the one hand, probably shouldered less of the regulatory burden than other regions because there isn't a heavy concentration of the most regulated and capital-intensive manufacturing and industrial sectors (oil, chemicals, autos, steel), and, for reporting purposes, relatively few corporate headquarters are located here. On the other hand, some of the region's main industries (pulp and paper, aerospace, aluminum, and food processing) have incurred higher-than-average pollution control capital costs. Given other considerations for inflation, world-wide commodity price cycles, and regional labor costs, EPA economists say that regional (Oregon, Washington, Idaho, and Alaska) costs should be about 4 percent to 5 percent of national costs.

That means that, between 1972 and 1986, the Northwest should have spent about $25 billion to $30 billion on pollution control goods and services. Since about two-thirds of PAC costs are generally incurred by private industry, private sector costs ought to have been $16 billion to $20 billion.

Yet the regional figures from Commerce for the 1972-1984 period show only $5 billion in private industry expenses. These particular Commerce numbers, unlike those used to arrive at the $700 billion figure, deal only with manufacturing and do not include the railroads, mines, and public utilities of the region or transaction costs.

Probable private sector costs were between $5 billion and $10 billion (in 1972 dollars), depending, as usual, on how inventive you get with indirect costs, such as lobbying. Private sector costs beyond capital expenditures and directly related operation and maintenance costs are interpretive and, thus, controversial. There is no public record or clearinghouse for determining these costs.

The Northwest Pulp and Paper Association, for example, maintains that the regional pulp and paper industry has spent close to $1 billion on capital equipment since the early 1970s and is spending another $100 million a year on operating costs. In another estimate by Direct Service Industries, Inc., 1986 BPA industrial users had operating costs of $50.1 million for pollution control equipment and claimed a present investment of $312 million in such equipment, which, projected over 15 years and adjusted for cyclical shifts in the aluminum industry, means at least another $1 billion or so. Boeing estimates that it has invested $600 million to $700 million in PAC equipment since the early 1970s. Industry has a lot of frightening figures, but the data are essentially impossible to interpret and compare unless a universal methodology is developed and unless businesses volunteer more information—which is not likely.

Future Megacost Estimates

Corporate planners are reluctant to discuss projected PAC outlays, beyond saying that they expect capital costs to stay level and operations and maintenance costs to be at least three times higher within five years (largely because of Superfund-related waste disposal fees and increasing water quality control costs).

Fortunately, public sector costs are easier to come by. Last year, the environmental committee of the Washington Roundtable, a coalition of state business executives, published a study of projected state and local government PAC expenditures for the next 12 years, through the 1995-97 biennium (Figure 1). Citing the escalating costs of water quality and Superfund (toxic waste) cleanup programs, the report projected state costs between $4 billion and $12 billion, depending on the scenario you accept. The scenarios were based on projections by state agencies: the high scenario was basically their going-in request (what they hoped to get); the medium scenario was the realistic one (what they could get after political horse trading), the low scenario was the bottom dollar (below which they would be ineffectual). The medium scenario is the most likely. Given the lowest scenario and the roughly two-to-one differential between private and public spending, at least $12 billion will be spent in Washington in the next 12 years on PAC ($8 billion private, $4 billion public), although the figure could also be three times that high.

More specifically, the Washington State Department of Ecology and the Puget Sound Water Quality Authority recently estimated costs of $2.3 billion (constant 1986 dollars) for water quality protection by state and local agencies between 1988 and 2000.

Where Does the Money Go?

Since the days of the 1970s, environmental costs have shifted from capital spending to operations and administration. As a perhaps extreme example of these trends, look at the pulp and paper industry. Compelled by environmental legislation in the early and mid-1970s, pulp and paper mills installed state-of-the-art pollution controls (secondary treatment plants, incinerators, chemical recovery systems, recovery furnaces, boilers) and their capital costs for that period reflect this. Equipment costs as a percentage of total plant and equipment spending, however, have been halved since 1976.

During the same period, operation and maintenance and administrative costs, according to Jack Larsen, Weyerhaeuser's vice president for Energy-Environment and Regulatory Affairs, have headed in the opposite

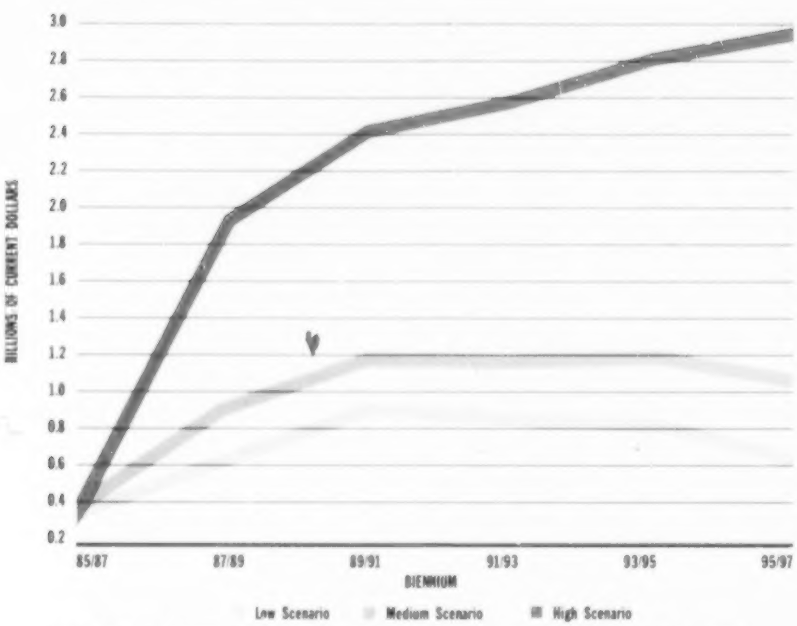
Table 1: Pollution Control Expenditures
in billions of 1972 dollars

YEAR	INVESTMENT	OPERATION
1972	8.775	7.136
1973	9.921	7.744
1974	10.143	7.879
1975	11.061	8.420
1976	11.326	9.106
1977	10.991	9.545
1978	11.578	10.141
1979	11.440	10.594
1980	11.142	11.023
1981	9.881	11.064
1982	9.075	10.725
1983	8.593	11.517
1984*	8.919	12.288

*estimate

Sources: U.S. Dept. of Commerce, *Survey of Current Business*, July 1986, and Environmental Protection Agency

Figure 1: Washington's Total Projected Environmental Expenditures
1985 through 1997



SOURCES: State Agency Projections and Washington Roundtable Environmental Committee Report on Environmental Controls, January 1986

direction. Operation and maintenance costs grew astronomically between 1975 and 1981 and have stayed steady since then. These expenditures now vastly exceed PAC capital outlays.

So what does this $30 million a year spent by Weyerhaeuser on noncapital pollution abatement and control costs on its Northwest operations buy? Ken Johnson, an environmental engineer at Weyerhaeuser's Longview complex, estimates that the site spends about $8 million a year on PAC costs: about $2.5 million on personnel, $1.5 million on capital costs, and $4 million on operation and maintenance.

What happens in Longview is important because this facility is the largest polluter in the state, at the top of the DOE's Dirty Dozen list of violators last year. But, then again, it is one of the largest integrated pulp and paper operations in the world, producing 3,000 tons of paper products a day.

Johnson monitors and reports on all PAC functions for his site's three operations (kraft paper, timber products, woodlands) to nearly a dozen federal, state, regional, and local overseers. He calls pollution abatement and control both capital and labor intensive. On the capital side, there is equipment, like a $1.3 million incinerator installed in 1985 to burn away noncondensing sulfur-based gases. In all, Johnson estimates, $70 million has been spent on PAC equipment at the Longview site since the early 1970s. Then there are the 60 or so full-time equivalent positions that Johnson claims are devoted to PAC.

Weyerhaeuser's Longview operation faces tough civil penalties if it doesn't treat or destroy hydrocarbons and other airborne emissions 98 percent of the time. State-of-the-art air quality equipment runs full-time—720 hours a month. If it runs at only 97 percent efficiency—that is, for 705 hours a month—Weyerhaeuser is fined because by law it is allowed only 14 hours a month of venting, or nontreatment, time for equipment maintenance and repair. This means that the complex treatment equipment must be extremely reliable, and Johnson says this translates into a labor-intensive operation, requiring instrument mechanics, engineers, and operators.

You can't make a case for tougher laws until you have better monitoring equipment, but you can't get industry to install the equipment without tougher laws.

The site's $50 million effluent-control system is the largest such pulp and paper operation in the world, treating about 53 million gallons of effluent a day. (By comparison, the city of Portland treats 63 million gallons a day.) The system requires 24-hour monitoring by at least six maintenance workers, engineers, instrument readers, and electricians. Plant effluent spends about five hours passing through a complex chain of primary and secondary tanks to remove the requisite 85 percent of the waste.

This complex system is subject to frequent crises and glitches: fluctuating production levels, chemical spills that threaten the system's bacteria, and shifts in treatment water oxygen supply and temperature, which reduce the bacteria count and lead to permit violations.

Johnson laments that "the permitting and monitoring processes are not nearly fine-tuned enough. For example, there's no measurable impact on the Columbia even if we aren't meeting specific permit limits. No one knows what, say, 95 percent compliance means versus 98 or 99 percent, but the difference between 95 and 98 is enormous for a business. Individual facilities spend a lot of dollars for little or no benefit."

DOE Director Riniker answers this common complaint about attaining the elusive "99th factor" by arguing that companies "often rig the process to take advantage of all the flexibility built into the regulations. That way they can always argue that they're fined for any slip-up. But permits aren't written so that a company that has a problem is automatically in violation. The companies just make it appear that way." Weyerhaeuser's Larsen denies this, arguing that complex regulatory protocols preclude any tinkering with the machinery or the monitoring apparatus.

One last consideration: even if Weyerhaeuser spends $50 million annually on pollution abatement and control, how does that commitment stack up in light of the company's 1986 sales of $7 billion (net profit of $276 million)?

The Boeing Company (1986 sales of $16.3 billion, net profit of $665 million) is not as forthcoming as Weyerhaeuser about PAC costs, largely because, according to Environmental Affairs Division spokesperson Judith work, the costs are spread out across the company's many divisions and sites.

Some indicators of Boeing's inaccessible PAC expenses do emerge, however. Environmental Affairs has 21 staffers and reports directly to the vice president for Governmental Affairs. Each division has dozens of environmental engineers, hydrologists, and chemists, and PAC-related legal costs are increasing. The company estimates that it has spent between $600 million and $700 million on PAC equipment since the late 1960s, including, most recently, $2.3 million on a secondary water treatment plant in Everett and $720,000 on other treatment facilities in Everett and Auburn.

"So," Fletcher says, "here we are trying to make a reasonable decision on extremely complex matters with incredibly incomplete information."

David Smukowski, the manager of Boeing's Environmental Controls Office, estimates that the company spends $100,000 per ton of airborne emissions per year on PAC equipment, and that as much as 15 percent of the cost of a new facility can go into air permit requirements and control equipment. New equipment that is potentially polluting also requires permitting and registration. Every paint booth and spray gun, for example, must be outfitted with BACT (best available control technology).

Boeing, like all manufacturers, also must file quarterly reports on all work related to asbestos, everything from removing plasterboard to changing a piping elbow. Each of these instances requires a $200 permit, and there are hundreds of these permits quarterly.

Each of Boeing's eight major sites has three or four people monitoring equipment, collecting test samples, and coordinating with sample labs. Air control equipment is especially expensive to test. When a major incinerator is installed, for example, the cost of the source test, according to Smukowski, runs about $250,000. Routine boiler analysis costs $3,000 per boiler, and there are also costs for annual fees, operating permits, registration permits, and inspections.

The Clean Water Act mandates that Boeing conduct a full-scale scan sample of the effluent from its discharge pipes for toxicants, metals, turbidity, and temperature. In Washington State, Smukowski says, Boeing spends $2,000 per pipe per month for most of their 63 pipes. It has its own treatment plants.

Water quality monitoring is exacting and expensive. In working with Metro pretreatment standards at its Renton plant, for example, Boeing employs several full-time environmental specialists to make sure it never exceeds the set hourly averages for discharge from, for example, metal finishers and electroplaters. The Renton plant has a built-in self-monitoring system that reports every 24 hours. "Continual, hourly, and daily monitoring" is the norm, says Smukowski, and lab tests can cost as much as $1,800.

In all, Smukowski estimates that, in its Puget Sound sites, Boeing spent $6.5 million in 1986 in water pretreatment monitoring, labor, lab work, and compliance costs, and $1.2 million in capital costs. Like Larsen and Johnson at Weyerhaeuser, Smukowski is concerned about cost accounting. Addressing DOE's recent call (which died in the last legislative session) for a large increase in fees for discharge permits, Smukowski explains: "Boeing accepts its obligation to meet regulations, pay licensing fees, and so on, but when we're told that fees are going to increase 800 percent, we would like some reassurance or documentation about how that money is going to be applied to meet the objectives of the program. We want some sense of cost accounting."

Circular Arguments

Environmentalists and regulators prefer discussing trade-offs rather than costs and argue that cost-effectiveness is a worthy, but often chimerical, aim. In water quality control law, for example, the burden of proof does not rest with the regulatory agencies, explains Katherine Fletcher, who chairs the Puget Sound Water Quality Authority, a nonregulatory planning body. "If you ask the regulatory body to prove cost-effectiveness, you will have an unworkable and unaffordable system," she says, citing the manpower and lab testing demands of such a system. As it stands with current law, Fletcher argues, DOE lacks the manpower it needs to monitor, to do routine (once a year, at best) inspections, and to review the monitoring reports it gets.

Fletcher argues that cost-effectiveness is a circular argument: "We don't know enough about either side. To know the economic impact of PAC on an individual corporation, we would need to know all about that particular company and that particular industry, which is information that is never on the table. On the other hand, it's difficult for the regulators to quantify impacts, magnitudes, or periods of time for accumulations of pollutants. So here we are trying to make a reasonable decision on extremely complex matters with incredibly incomplete information."

One of PSWQA's high-priority items is better monitoring and analyzing of discharge data to fine-tune standards because, Fletcher argues, "we just don't know very much about the science yet." Beyond controlling obviously hazardous discharges of major toxicants, she claims, regulators "are not adequately staffed to determine limits of toxicants that should be reflected in permits." Yet, she adds, "dischargers are reluctant to be a part of the process that we would need to get better data," because they object to increased monitoring costs and equipment. You can't make a case for tougher laws until you have better monitoring equipment, but you can't get industry to install the equipment without tougher laws.

"It's a question of how much you want to know," Fletcher says, "how much you need to know, and what you probably won't ever know because the data just aren't there. But before we can say we're spending the right amount, we must know more about the impacts."

Two other major problems with cost-effectiveness arguments, according to DOE Director Riniker, are that most environmental standards are national and not open to flexible state mitigations and cause-and-effect is often clear only after a long period of time, and then in the aggregate, as in the case of discharges into waterways. It's not possible to trace a given discharge to a given pipe at a given time. Yet Riniker also champions different types of cost-effectiveness arguments, saying that "environmentalists sometimes needlessly shy away from any discussions of cost-effectiveness because they think that's the creed of business."

Riniker cites four cost-effectiveness arguments that environmentalists might use. First, it costs more to clean up pollution, like hazardous waste, now than it would have cost to prevent it 10 years ago. Second, companies can claim that "we market ourselves to the world as a region with clean air and water." There is, third, a large and thriving pollution control and cleanup industry in the state. And, fourth, acrimonious debate about hazardous waste is not attractive to businesses looking to relocate in the state. They need assurance that we have the hazardous waste process under control in terms of permits, facilities, and cooperative processes, and they also need to know they will be relieved from liability if they follow these processes.

Environmental Bad Faith?

The more orthodox environmentalist position argues that while industries claim environmental good citizenship and can point to impressive-looking PAC efforts, they are often reluctant environmental partners that drag their feet, frustrate efforts to set higher standards, exaggerate costs, and try to pollute to the maximum allowable levels—all of which are signs of basic environmental bad faith.

"The big polluters have a history of inconsistencies and hypocrisy in the state," argues Jolene Unsoeld, the Democratic State Representative whose House-passed version of the state Superfund bill was killed in the Senate last spring and who is helping spearhead the drive to get a Superfund initiative on the ballot this November. Citing repeated industry opposition to clean water bills and other hazardous waste management bills, she claims that "industry really hasn't switched over in its mentality, and the companies' constant litany about costs and cost-effectiveness proves that. They assume that they still have a right to pollute."

Unsoeld claims that the cost-effectiveness arguments are a smokescreen. "Why should the DOE have to present evidence to show that if Company X cleans up Toxic Y it will make Puget Sound cleaner? Why should the state have to prove such a thing? Why do the companies continually force us into this dangerous game of 'Let's see how much dirt we can throw into the Sound and get away with.' Why don't they concentrate on finding ways to remove the discharges before they get into the water?"

"As in adolescence," says Riniker, "there are lots of ups and downs [in environmental control], and things go well, then fall apart. It's a very emotional time."

Others who are critical of the corporations' ways of accounting for PAC costs say that the way to consider the numbers is in relation to other figures, such as annual sales, annual lobbying costs, total plant investment after netting out all PAC subsidies, increased productivity from abatement equipment, and after annualization of costs over the future stream of output.

The Evolution of Cooperation

Given industry's increased need for cost-effective pollution controls and the typical liabilities and disappointments of environmentalism's adolescence, there comes a time—in the late 1980s—when relative strangers feel the need to get along. Have economic constraints on both sides increased the level of mutuality?

One promising sign is that the Puget Sound Water Quality Authority, one of the region's primary environmental planning groups, has slowly come around to pragmatic, consensus-building solutions. For example, a draft plan for Puget Sound water quality had zero discharge as its goal, but now, Assistant Director Nancy McKay concedes, "we aren't offering any set target figure, but just aiming to make the permitting process easier for everyone. We listened to business and came to realize that zero discharge was just too expensive."

So the main sticking point really isn't compliance versus noncompliance, but, as PSWQA chair Katherine Fletcher cited, "how much we want to know, how much we need to know, and how much we can know" about the effects of pollutants on our air and water. Everyone readily agrees that more must be known, and all reluctantly acknowledge that every incremental increase in knowledge is more expensive than the last in terms of monitoring, inspecting, toughening regulations, and mandating new equipment or more efficient equipment.

The business community has bought, or been forced to buy, deeply into the game and seems willing to make some new, painful trade-offs. But, businesses are very nervous about uncontrollable external costs. You get the sense that business has done more than the public thinks to comply with environmental regulations; yet, you also get the impression that business could do more and that the status quo in which business PAC costs are remaining fairly steady is about to be broken as corporations are asked—or forced—to do more. At the same time, government regulators will begin making more focused arguments based on cost estimates and identifiable outcomes, rather than absolutes like zero discharge.

Cost-accounting measures and perhaps market-based incentives are in the wind, then, but shouldn't be heralded breathlessly as a coming golden age. But if not a golden age, perhaps we are at least developing a growing mature acknowledgment of costs, consequences, and limits—all the harsh lessons of adolescence. Environmental adolescence is still evolving and has a long way to go to reach maturity and stability.

Environmental control in the late 1980s "is still in the pimply, bumpy stage," muses Riniker. "As in adolescence, there are lots of ups and downs, and things go well, then fall apart. It's a very emotional time for both sides, but also a crucial time, when values are clarified and we sort out what will guide us for the rest of our lives." She then adds hopefully: "It's also supposed to be the time when we develop the social skills to resolve conflicts."

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REGION WATCH

Economic Developments in the Pacific Northwest

Growth of income and employment

Personal income and employment statistics are important monitors of the direction of the Pacific Northwest economy. The statistics for the early months of 1987 are providing a picture of a very slow growing economy.

The personal income statistics for the first quarter of 1987 are preliminary and therefore subject to later revision. Nominal total personal income grew in the first quarter of 1987 in Washington and Oregon, but fell in Idaho (Table 1). In Washington and Idaho, the growth rate was lower than it was in the fourth quarter of 1986; in Oregon the rate was essentially unchanged. By contrast, personal income growth on a national basis expanded more rapidly in the first quarter of 1987 than it did in the fourth quarter of 1986. Adjusting these data for inflation produces a decline in real total personal income in all three Pacific Northwest states, compared to a small gain at the national level in the first quarter of 1987.

Table 1: Quarterly Personal Income
quarter-to-quarter percent changes

	NOMINAL		REAL	
	TOTAL	NONFARM	TOTAL	NONFARM
UNITED STATES				
1986: IV	0.9	0.8	0.1	0.0
1987: I	1.7	1.5	0.3	0.1
WASHINGTON				
1986: IV	3.3	2.7	2.5	2.0
1987: I	0.8	1.6	−0.5	0.2
OREGON				
1986: IV	0.7	0.3	−0.1	−0.5
1987: I	0.8	1.5	−0.6	0.1
IDAHO				
1986: IV	1.9	−0.4	1.1	−1.2
1987: I	−1.5	1.7	−2.8	0.3

Source: U.S. Department of Commerce

Much of the quarter-to-quarter vacillation is due to federal commodity program payments to farmers. From the third quarter of 1985 through the first quarter of 1987, there was a seesaw pattern to farm income and one of its important components, farm proprietors income. Nonfarm income may be a more reliable indicator of the economic health of the region than total personal income, especially for urban areas. Real nonfarm income rose slowly in all three states in the first quarter of 1987.

The employment data tend to confirm these impressions. Seasonally adjusted data reveal a labor force that changed little in the first quarter of 1987 in Washington and that declined in Oregon and Idaho. Employment levels have been virtually unchanged in Washington, as has the number unemployed. In Oregon, declines in the labor force produced a decline in the number of unemployed workers. In Idaho, the labor force and employment both declined, producing a falling unemployment rate. As statistics for the summer months are released, some employment gains beyond the usual seasonal upswing may be realized, especially in Washington and Oregon.

While the data from early 1987 are not very encouraging, it is worth recalling that the first quarter of 1987 was expected to be a weak one as a result of individual and business adjustments to the new federal personal income tax rules. The data confirm this expectation; aside from large business inventory increases that buoyed the first quarter GNP report, several signs of a slow economy were present, including a decline in personal consumption expenditures. We believe that the rest of 1987 will show modest economic gains. If growth continues through 1988, this will become the longest peacetime expansion on record.

Forecast panel

Our 17 member forecast panel expects sluggish GNP growth and rising inflation during 1987 and 1988 (Table 2). The only noticeable change in our third quarter survey, compared to the second quarter survey, is a slight lowering of the expected rate of inflation and a more even rate of real GNP growth during the two years. The panel's forecast of the national outlook, like that of the national survey conducted by the National Association of Business Economists, calls for growth continuing through 1988. Only two of our panelists suggest a recession in 1988, and five are predicting GNP growth of 3 percent or more.

At the regional level, the Washington panelists forecast nominal personal income growth of 5.5 percent in 1987 followed by a 5.9 percent gain in 1988. Personal income growth in Oregon is expected to be slightly lower than that in Washington, but this would be an improvement over Oregon's 1986 growth. In Idaho, a very slow rate of income growth in 1986 should be followed by a slow upswing in 1987 and 1988. Job gains in Washington are predicted to be slower than in 1986, although the panelists are generally more sanguine than they were in the second quarter survey. In Oregon and Idaho, economists are expecting faster rates of employment growth than in 1986, but the rates anticipated in Idaho are well below those expected in Washington and Oregon.

While employment and incomes are forecast to rise throughout the region, the arithmetic of predicted job growth (3 percent), personal income growth (5 or 6 percent), and inflation (4 percent) suggests that real personal income per worker will fall. Although no recession is yet in sight and the stock market remains bullish, most Pacific Northwest workers are likely to find that their bigger paychecks buy less at the checkout counter.

A panel member who recently made a trip down the Washington and Oregon coast noted a resurgence of economic activity in the small towns dependent on forest products. At the same time, he reported a fear on those Main Streets that the current mini-boom could lead quickly to another bust.

Boeing boom continues

The Boeing Company, linchpin of the Puget Sound economy, seems well on its way to another very strong year. Sales for the first half of 1987 indicate an annual pace exceeding that of 1985 and coming within striking distance of the all-time record set in 1986.

Boeing's excellent performance is fueled by the growth of the world economy, and by Boeing's continued ability to innovate. New freighter models, additional versions of the venerable 737, new computer services, and a variety of electronic products are adding to the company's sales. Research and development expenditures are also climbing as the company looks at new commercial aircraft models and targets space and military program opportunities that require up-front development efforts.

Table 2: Panel Forecasts

median annual percent changes

	REAL GROSS NATIONAL PRODUCT	IMPLICIT PRICE DEFLATOR
1986 actual	2.5	2.7
1987	2.5	3.6
1988	2.6	4.5

	NOMINAL PERSONAL INCOME	NONAGRICULTURAL EMPLOYMENT	MANUFACTURING EMPLOYMENT
WASHINGTON			
1986 actual	5.7	3.5	2.9
1987	5.6	3.2	2.5
1988	5.9	2.8	2.0
OREGON			
1986 actual	5.1	2.3	−1.3
1987	5.4	3.0	0.8
1988	6.0	2.9	1.0
IDAHO			
1986 actual	2.6	−0.4	−5.4
1987	3.2	0.7	0.0
1988	4.5	1.0	0.5

Recently the company has attracted the attention of corporate raider T. Boone Pickens, who filed a notice of intent to acquire up to 15 percent of Boeing's stock. His ultimate intentions were not clear, but the notice spurred the Boeing board into taking a "poison pill" action to ward off a possible takeover attempt. And the state legislature, called into a one-day special session in August, passed legislation designed to prevent the sale of assets or the dismissal of employees following a takeover.

Additional sales, new products, and development programs create new jobs, many of them at Boeing's Puget Sound facilities. Total company employment is expected to rise by 3,000 to 4,000 by the end of 1987. In Washington, aerospace employment totaled 91,800 as of June 1987, a gain of 7,200 since June 1986. The prospect of additional aerospace growth is very good news for the local economy.

High-tech siting decisions

Several upcoming siting decisions for major high-tech facilities are keeping regional economic development officials busy. U.S. West is looking at Oregon, Idaho, and 12 other western states as potential sites for a telecommunications research facility. A consortium of semiconductor manufacturers is considering Oregon as a location for a site for a large research facility.

All three states are bidding for the U.S. Department of Energy's Superconducting Supercollider, a large research facility that would employ 2,500 scientists, engineers, and technicians. The Economic Development Partnership for Washington has submitted a proposal to the U.S. Department of Energy naming a Lincoln County site for the facility. Oregon has submitted a proposal offering either of two locations, one near Lebanon and the other near Hermiston. Idaho is suggesting a site at the Idaho National Engineering Laboratory.

The competition for each of these facilities is tough. Any one of them would bring in hundreds of highly paid scientists and engineers. Bill Grinstein, the president of the Economic Development Partnership for Washington, notes that 23 states submitted proposals for the Supercollider. He feels certain, however, that Washington's proposal will make the short list, which is supposed to be announced by the Department of Energy early next year. Competing officials in Oregon and Idaho believe their proposals too will make the short list, and strong competition also exists in states such as Illinois and Texas.

Aluminum rebounds

The summer brought several pieces of good news for the aluminum industry in the Pacific Northwest. Former DSI Association Executive Director Brett Wilcox purchased and reopened the aluminum plant at the Dalles early this year. In June, Hermiston lawyer Kenneth Peter-

Worth Reading

The Bonneville Partnership: A Proposal *by the Bonneville Power Administration, Portland, OR, June 1987, 99 pages, no charge.*

As the Bonneville Power Administration (BPA) struggles to bring revenues in line with costs, it seeks to expand the markets for its surplus power within the Pacific Northwest. In this effort it has renewed a historic theme: the power partnership policy. Unlike the controversial partnership themes of earlier BPA history, which revolved around public versus private dam construction and power transmission, this new version provides incentives to BPA customer utilities to aggressively market BPA power to end-users.

The basic elements of the proposal are described briefly by BPA Administrator James J. Jura in this issue (page 23), but the document under review provides a more detailed discussion of the proposed marketing framework. As described in the document, the marketing programs are intended to be mutually beneficial, not to encourage competition among electric utilities. According to the proposal, BPA customer utilities would implement the marketing program through discounted power sales to selected end-users—without displacing revenues from sales that would have occurred in any case. The emphasis would be on discounts for new uses, expanded usage, the activation of idle capacity, the prevention of plant closures (all of which have an economic development dimension), and the displacement of wood fuels (specifically, wood-burning stoves).

The forms of market segmentation outlined in the proposal are administratively complex; it will be interesting to see how BPA customer utilities react to them. The proposal also raises competitive issues vis-à-vis competing fuels such as natural gas and petroleum. Despite the rhetoric about a partnership, the salient economic features of the proposal can be characterized as market segmentation and price discrimination. If such a proposal were made by a private entity, the Antitrust Division of the U.S. Department of Justice might well take an interest in the matter. Before the proposal is adopted, end-users and, particularly, suppliers of competing fuels should take a close look at the impacts of the program.

son, who had also bid on the Dalles plant, put together a deal for the former Commonwealth Aluminum smelter at Goldendale. Peterson expects the plant to be open for business with a work force of 450 by the time this issue goes to press. The plant will operate on a contract smelting basis, as will the Dalles facility.

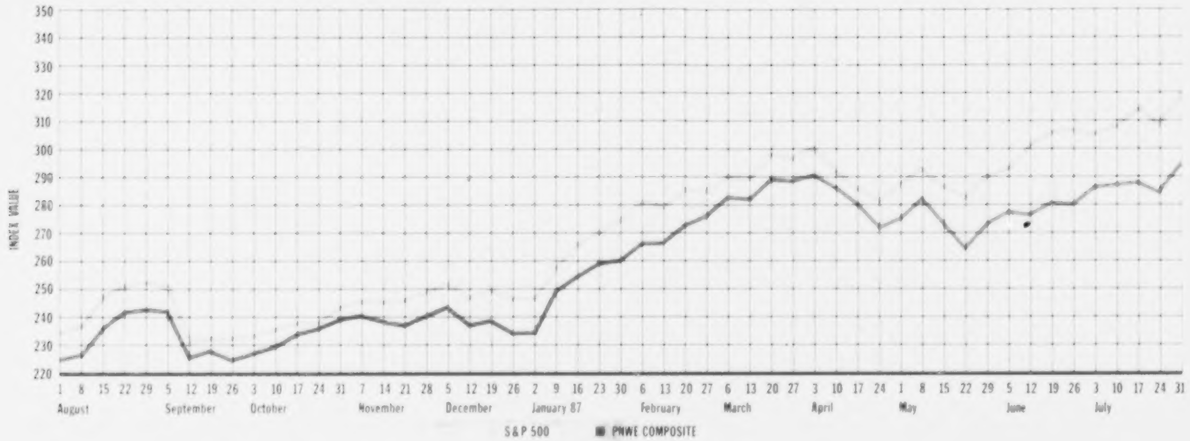
Several factors are important in reopening these plants. First and foremost, aluminum prices have recovered from an October 1985 low of less than 45 cents per pound to more than 73 cents per pound as of July 1987 (*Metals Week*). This strong price recovery is a prerequisite for reopening older, relatively high cost smelting operations. Second, the Bonneville Power Administration has offered a variable power rate that is tied to the price of aluminum. Third, both Wilcox and Peterson negotiated significant wage concessions with work forces that had few local alternatives for employment. Profit-sharing arrangements, which helped cushion the blow of lower wages, were included in the new labor agreements. Profit-sharing provides aluminum workers with an incentive to maximize productivity, which enhances the probability of long-term survival for these two plants.

B&O tax in Washington

On June 23, 1987, the U.S. Supreme Court ruled that Washington's Business and Occupation tax is not constitutional in its present form. The extent of revenue loss due to this ruling is uncertain. Depending on the interpretation of the ruling, the state could experience a net revenue gain of $60 million or a loss of more than $400 million. The largest revenue losses would occur if the state is required to refund taxes previously collected under disputed provisions of the law. This issue was remanded to the state supreme court. With the issue of refunds unresolved, the state legislature made a minor correction in the law in its one-day special session in August. This corrective legislation gives manufacturers credits for similar taxes paid elsewhere (Michigan and Hawaii are among the handful of states that have similar taxes).

The Pacific Northwest Executive Stock Index

S&P 500 and the PNWE Index, August 1, 1986-July 31, 1987



Index Values*

LAST FRIDAY OF	PNWE COMPOSITE	SMALL FIRMS	LARGE FIRMS	MANUFACTURING	TECHNOLOGY	UTILITIES	RETAIL FINANCE AND OTHERS
AUGUST 1986	242.89	282.59	248.46	245.72	192.38	269.67	233.74
SEPTEMBER 1986	224.44	290.66	229.31	225.69	186.62	244.92	217.78
OCTOBER 1986	239.01	321.75	242.98	238.66	213.39	254.76	236.37
NOVEMBER 1986	239.78	316.58	241.11	238.09	231.63	257.59	232.97
DECEMBER 1986	234.36	337.84	234.59	239.09	223.23	247.44	221.15
JANUARY 1987	260.12	368.42	251.99	266.74	285.37	261.00	239.52
FEBRUARY 1987	276.29	401.15	266.71	284.67	302.00	254.23	265.12
MARCH 1987	288.03	423.64	272.71	301.67	315.47	252.99	275.03
APRIL 1987	271.77	403.55	252.63	282.37	315.19	235.24	259.70
MAY 1987	273.64	443.06	255.45	267.54	351.24	236.50	278.43
JUNE 1987	280.20	323.97	265.16	277.98	351.12	245.25	281.60
JULY 1987	294.15	278.18	285.47	295.31	332.35	240.74	310.27

*All PNWE indexes set equal to the S&P 500 index of 210.88 on January 3, 1986

Specialty and Traditional Agriculture in the Pacific Northwest

by Michael V. Martin and Bruce A. Weber

Agriculture, a major component in the economy of the Pacific Northwest, is particularly important to a number of rural subregions and communities. At the 1985 farm level, Pacific Northwest agriculture generated gross farm income of $2.2 billion in Oregon, $3.4 billion in Washington, and $2.5 billion in Idaho. But agriculture is a complex economic sector; it encompasses a diverse set of crops and production techniques, and varied input sales, processing, and marketing activities. When agriculture, or some part of it, experiences a prolonged recession, the entire region is affected.

Many of the region's farmers, particularly those who produce grains and livestock, began having financial difficulties in 1981 and are still facing hard times. The problems confronting these farmers have economic implications well beyond individual enterprises. This analysis describes the region's agricultural economy, outlines the current economic situation and outlook for Pacific Northwest agriculture, and discusses the links between Pacific Northwest agriculture and its regionwide impacts.

Specialty and Traditional Agriculture

In terms of production, the Pacific Northwest is served by a dual agriculture system. Certain subregions of the Pacific Northwest, for example, produce high valued specialty crops for fresh sales or processing. These regions are characterized by a moderate winter climate and high rainfall. Western Washington and the Willamette Valley of Oregon, for instance, produce a wide range of specialty agricultural crops, including grass seed, tree fruits, nuts, vegetables, nursery products, wheat, and dairy products. This diversified subsector is reliant on off-farm labor and the farms are generally capital-intensive and small in terms of acreage.

Note, for example, that agriculture in the three Portland metropolitan counties (Clackamas, Washington, Multnomah) produced 16.1 percent of Oregon's agricultural sales in 1986 on 5.5 percent of the state's agricultural land. In the past six years, the contribution of these counties to total state agricultural sales has increased. The leading crops produced in these counties include specialty horticulture, vegetables, small fruits and berries, and tree fruits and nuts. While agriculture in general has been trapped in a recession that began in 1981, producers of specialty crops, tree fruits, and grass seeds have fared reasonably well.

The other subsector of Pacific Northwest agriculture is more traditional in nature and is dominated by the production of grains, livestock, and forage crops. (In some areas within this region, potatoes are also a major crop, and some producers of traditional crops grow them as part of their rotations.) The eastern portions of Oregon and Washington and much of Idaho depend on this segment of agriculture for an economic base. Many communities in eastern Oregon, eastern Washington, and Idaho serve traditional agriculture and are now experiencing the economic downturn that has struck producers.

The diversified nontraditional segment of agriculture now makes a larger contribution to the region's total economy than does more traditional agriculture. In Oregon, for example, the nominal value of all agricultural sales remained fairly stable through the first half of the 1980s—the result of fairly significant increases in the value of specialty sales from western Oregon, combined with a marked decrease in the value of sales from the traditional commodities produced in eastern Oregon.

A similar agricultural economic shift has occurred in Washington and Idaho. In 1981 wheat sales made up 23.6 percent of total agricultural sales in Washington. Vegetables, fruits, and nuts totaled 11.2 percent and 13.1 percent, respectively. In 1985 wheat sales dropped to 17.4 percent, while vegetable sales rose to 15.2 percent, and fruits and nuts increased to 17.4 percent of Washington's agricultural sales.

The higher value or value added nature of nontraditional agriculture creates substantial employment and income for the Pacific Northwest. Nontraditional agriculture tends to occur in broader based economic subregions, where a variety of other economic activities, including high-tech manufacturing, services, education, and government, are also important.

Traditional agriculture is practiced in most communities in eastern Oregon, eastern Washington, and Idaho, where few other economic activities or alternatives are available. Even though it does not dominate regionally, traditional agriculture is more important in relative terms to a huge geographic subregion of the Pacific Northwest.

The Current Economic Situation in Pacific Northwest Agriculture

Since the early 1980s, many producers of grains and livestock have been burdened by excessive and expensive debt, increasing production costs, rapidly declining asset values (land, in particular), and a sharp drop in sales volume and value. As a consequence these producers are caught in a serious profit squeeze. Farmers have experienced increased loan delinquencies, a decrease in loan approvals, increases in foreclosure rates, and serious economic stress—even for many who have remained financially viable.

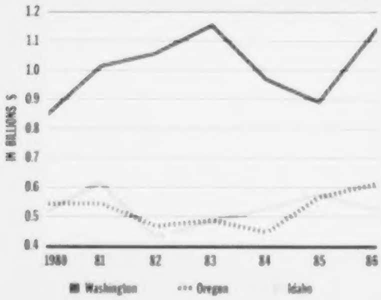
In Washington, the share of farm operating expense attributed to interest charges increased from 6 percent to 14 percent between 1979 and 1985. Farm debt rose from $2.5 billion to $3.8 billion. As a consequence, the debt to equity ratio has increased from 24.3 percent to 32 percent. In a real sense, many producers of traditional crops have cannibalized their equity to meet their financial obligations during this period of sustained recession.

In all three Pacific Northwest states, farm land values have fallen during the past five years. In Washington the average per acre decline has been 9 percent, in Oregon 29 percent, and in Idaho 23 percent. Because the prices of land for specialty crops have remained largely unchanged, the overall reduction in land values has been the result of massive declines in the price of land used in traditional agriculture.

(continued on page 14)

Pacific Northwest Agricultural Production Indicators[1]

FARM PERSONAL INCOME



NUMBER OF FARMS[2]
In thousands

YEAR	WA	OR	ID
1960	56.0	47.0	36.3
1965	48.5	43.0	31.2
1970	41.0	34.5	28.5
1975	34.0	30.0	24.1
1980	38.0	35.0	24.4
1982	39.0	37.0	24.2
1983	38.0	37.5	24.4
1984	38.0	37.0	24.6
1985	38.0	37.0	24.6
1986	38.0	37.0	24.0

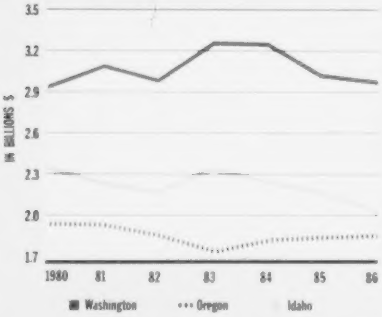
TOTAL VALUE OF AGRICULTURAL PRODUCTION
In millions $

WA	OR	ID
612	450	516
703	495	556
892	614	723
1,994	1,179	1,442
2,948	1,934	2,322
2,981	1,885	2,180
3,239	1,740	2,323
3,250	1,818	2,269
3,006	1,840	2,189
2,971	1,859	2,004

FARM PERSONAL INCOME[3]
In millions $

WA	OR	ID
268	185	159
288	186	238
356	227	274
866	390	434
858	540	518
1,056	471	417
1,153	493	492
972	446	528
899	570	591
1,148	605	520

AGRICULTURAL PRODUCTION



LIVESTOCK AND LIVESTOCK PRODUCTS
In millions $

YEAR	WA	OR	ID
1960	224	191	165
1965	235	186	175
1970	306	254	269
1975	454	321	386
1980	811	565	759
1982	892	568	730
1983	908	564	735
1984	930	570	728
1985	885	558	758
1986	885	552	713

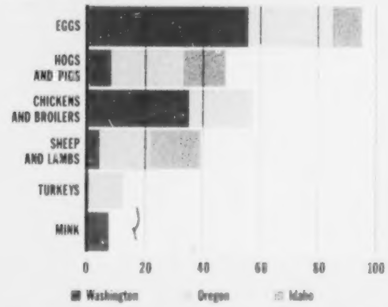
CATTLE AND CALVES
In millions $

WA	OR	ID
68	82	87
76	92	100
113	141	168
132	155	231
311	312	483
335	280	400
317	273	396
340	277	405
288	265	410
294	254	389

MILK
In millions $

WA	OR	ID
85	53	57
87	47	52
125	59	73
213	92	127
383	158	240
440	184	290
476	194	298
467	186	281
478	189	293
469	188	280

SELECTED LIVESTOCK,[5] 1986
In millions $



FIELD CROPS[6]
In millions $

YEAR	WA	OR	ID
1960	251	152	343
1965	295	154	365
1970	378	171	436
1975	1,077	533	1,017
1980	1,432	743	1,511
1982	1,356	696	1,400
1983	1,485	722	1,521
1984	1,509	725	1,472
1985	1,232	660	1,386
1986	1,038	593	1,225

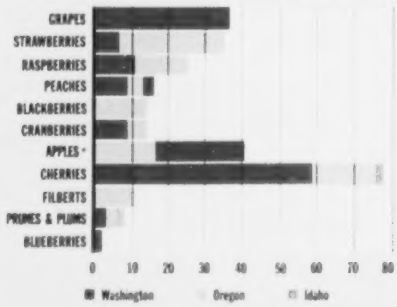
WHEAT
In thousands of bushels and millions $

WA		OR		ID	
Bushels	Value	Bushels	Value	Bushels	Value
65,102	117	26,626	48	34,018	57
90,828	121	28,399	39	47,973	62
92,800	137	26,717	39	41,582	58
147,880	553	58,040	219	63,220	215
160,220	638	77,400	308	96,030	351
138,880	561	63,500	255	94,200	357
172,570	637	65,570	242	91,710	318
160,350	553	68,945	239	81,400	268
128,250	437	56,040	191	72,030	235
116,850	286	58,405	143	81,750	187

SUGAR BEETS
In millions $

ID
20
37
48
73
152
118
141
123
128
NA

SELECTED FRUIT CROPS,[8] 1986
In millions $



FRUIT AND NUT CROPS
In millions $

YEAR	WA	OR	ID
1960	87	42	5
1965	98	57	8
1970	122	61	7
1975	209	76	13
1980	370	126	27
1982	389	142	30
1983	507	134	27
1984	461	127	29
1985	490	167	38
1986	622	182	31

WASHINGTON APPLES
In millions $

1000 Tons	Value
485	53
618	69
696	70
1,100	134
1,503	248
1,308	253
1,528	349
1,475	326
1,025	349
1,550	489

PEARS
In millions $

WA	OR
8	10
10	18
19	11
30	24
55	38
52	37
49	33
55	40
69	53
78	56

CHERRIES
In millions $

WA
5
1
10
20
30
38
56
41
37
59

BERRIES
In millions $

OR	WA
16	NA
21	NA
22	NA
19	13
31	17
48	29
53	27
44	22
51	29
68	25

GOVERNMENT PAYMENTS[4]
In millions $

YEAR	WA	OR	ID
1960	10	9	13
1965	40	24	29
1970	58	23	48
1975	7	5	9
1980	9	6	8
1982	77	31	52
1983	159	67	136
1984	171	76	133
1985	155	71	122
1986	299	128	223

AVERAGE NET INCOME[3, 5] PER FARM
In $

YEAR	WA	OR	ID
1960	4.786	3.936	4.380
1965	5.938	4.326	7.628
1970	8.683	6.580	9.614
1975	25.471	13.000	18.008
1980	22.579	15.429	21.230
1982	27.676	13.730	17.231
1983	30.342	13.147	20.164
1984	25.579	12.054	21.463
1985	28.553	13.054	20.041
1986	NA	NA	NA

FARM ASSETS[4] including households
In millions $

YEAR	WA	OR	ID
1960	NA	NA	NA
1965	NA	NA	NA
1970	NA	NA	NA
1975	7.763	6.438	7.286
1980	15.660	13.355	13.917
1982	18.928	14.793	15.353
1983	19.183	14.391	14.600
1984	19.698	14.382	14.997
1985	17.992	13.183	13.137
1986	NA	NA	NA

RATIO OF[3] PRICES RECEIVED TO PRICES PAID
United States 1977 = 100

YEAR	
1960	118
1965	115
1970	109
1975	113
1980	97
1982	85
1983	84
1984	86
1985	79
1986	76

AVERAGE VALUE OF FARM LAND AND BUILDINGS
price per acre

YEAR	WA	OR	ID
1960	NA	NA	NA
1965	NA	NA	NA
1970	NA	NA	NA
1975	NA	NA	NA
1980	736	587	689
1982	922	705	839
1983	933	705	814
1984	961	698	814
1985	923	579	749
1986	812	521	644

VEGETABLE CROPS
In millions $

YEAR	WA	OR	ID
1960	25	28	3
1965	41	38	8
1970	42	41	11
1975	94	93	26
1980	118	126	25
1982	145	97	27
1983	139	130	40
1984	150	141	30
1985	156	111	26
1986	152	118	35

SELECTED VEGETABLES FOR 1985
In millions $

	WA	OR
Onions	16	40
Sweet Corn	22	26
Asparagus	41	NA
Green Peas	20	7
Snap Beans	1	24
Carrots	12	3
Cauliflower	NA	6
Mushrooms	6	NA
Broccoli	NA	5

POTATOES
In millions $

YEAR	WA	OR	ID
1960	19	19	79
1965	29	18	119
1970	51	27	144
1975	152	78	294
1980	193	91	451
1982	198	82	321
1983	230	96	447
1984	293	112	420
1985	220	96	323
1986	253	103	380

BARLEY
In millions $

YEAR	WA	OR	ID
1960	21	17	15
1965	16	18	24
1970	20	19	40
1975	59	23	97
1980	94	30	172
1982	110	34	191
1983	140	43	185
1984	143	41	219
1985	122	39	173
1986	72	33	152

HOPS
In millions $

YEAR	WA	OR	ID
1960	11	3	3
1965	16	3	3
1970	17	4	3
1975	31	8	5
1980	86	17	8
1982	93	26	16
1983	92	22	16
1984	87	15	16
1985	66	17	15
1986	58	15	12

NURSERY AND GREENHOUSE PRODUCTS
In millions $

YEAR	WA	OR[7]
1960	NA	16
1965	NA	20
1970	NA	29
1975	NA	50
1980	90	133
1982	96	133
1983	100	150
1984	100	159
1985	95	172
1986	90	194

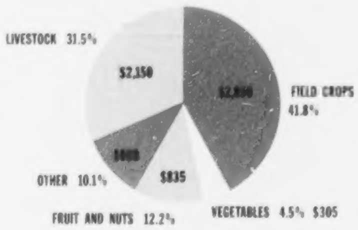
OTHER FIELD CROPS, 1986
In millions $

	WA	OR	ID
Hay	184	218	262
Corn (Grain)	38	9	14
Corn (Silage)	27	12	NA
Seed & Grass	NA	NA	NA
Mint	26	27	5
Dry Beans	12	NA	45
Oats	2	10	2
Dry Peas	18	NA	NA
Lentils	27	NA	NA

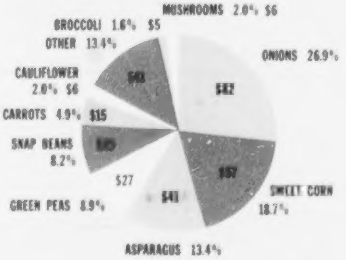
SELECTED FRUIT AND NUT CROPS, 1986
In millions $

	WA	OR
Grapes	37	NA
Strawberries	7	29
Raspberries	11	15
Peaches	9	4
Blackberries	0	14
Filberts	0	11
Cranberries	6	6
Prunes	3	3
Blueberries	2	4

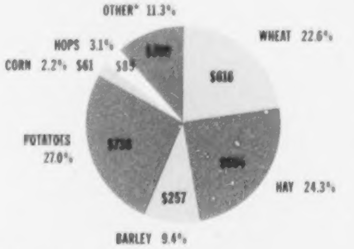
AGRICULTURE PRODUCTION, 1986
Pacific Northwest, in millions $



VEGETABLE PRODUCTION, 1986
Pacific Northwest, in millions $



FIELD CROPS, 1986
Pacific Northwest, in millions $



*Data not available for Idaho sugar beets

NOTES

1 Unless otherwise noted, figures are those of the Crop and Livestock Reporting Services of Washington, Oregon, and Idaho. We thank the personnel of these offices for their efforts to provide us with data. Values of production numbers are listed in millions of dollars. Readers should be aware that some numbers are subject to revision. The term "NA" means that these numbers were not yet available.

2 In 1975 the definition of a farm was changed to include places with agricultural sales of $1,000 or more.

3 Bureau of Economic Analysis, U.S. Department of Commerce.

4 U.S. Department of Agriculture.

5 Revised to include all farm income and farms.

6 The total value of Idaho's field crops in 1986 is estimated by assuming that the value of beet production in 1986 is $128 million.

7 Department of Agricultural and Resource Economics, Oregon State University. Figures prior to 1980 do not include the value of bulbs, turf, and miscellaneous specialty products.

8 Value of production not available for all states.

Federal Farm Programs

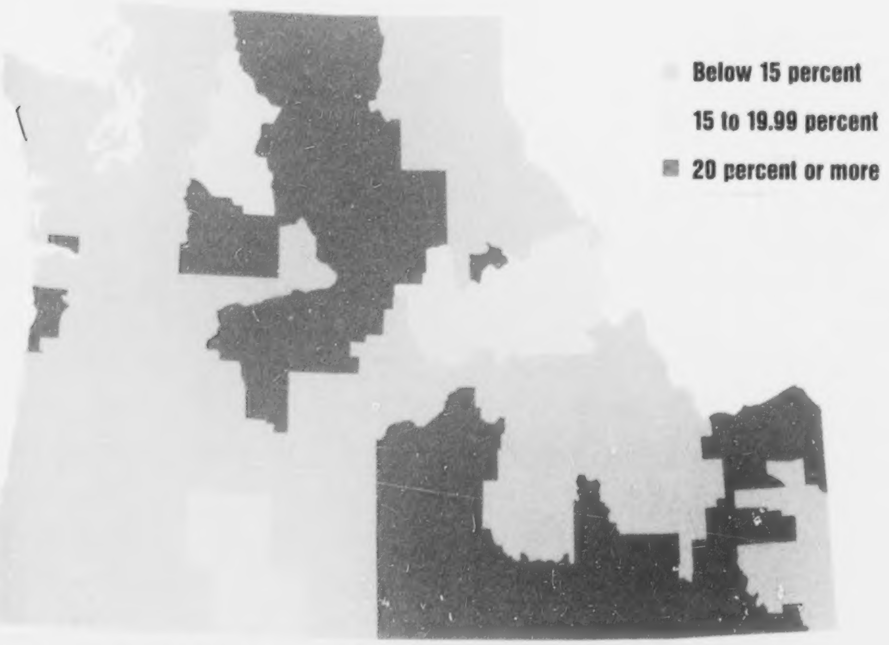
In the past six years, producers of traditional crops in Oregon, Washington, and Idaho have become increasingly dependent on government transfer payments to sustain their operations. In some counties, federal agricultural transfer payments now make up more than half of net farm income. Regionwide commodity program transfer payments have increased at a phenomenal rate: in 1980 payments to Washington, Oregon, and Idaho farmers under federal commodity programs totaled $23.3 million; by 1985 these payments totaled $348 million. (Federal payments to Oregon producers increased from $4.9 million to $71.4 million, payments to Washington producers jumped from $9.5 million to $155.1 million, and payments to Idaho producers grew from $7.9 million to $121.5 million.) In 1979 federal payments made up 0.6 percent of Washington gross farm income and 2.6 percent of net farm income; the 1985 transfer payments share of gross and net farm income rose to 4.6 percent and 39.4 percent, respectively. During this period, total federal payments to Washington agriculture increased more than ninefold.

The 1985 Farm Bill, officially entitled the Food Security Act of 1985 (FSA-85), provides a number of incentives for eastern Oregon, eastern Washington, and Idaho farmers to set aside production capacity in the short term and, in some instances, reduce total production capacity in the long term. The 1985 Farm Bill strongly encourages participation in federal commodity programs. Virtually all of the region's wheat farmers, for instance, have enrolled in a government wheat program that calls for set-asides of up to 30 percent of historic base acreage. In return for acreage set-asides, farmers are guaranteed minimum prices for their output and direct income subsidies through the Deficiency Payments Program. Because the 1985 benefits are more generous than those under prior bills, transfer payments to farmers will increase substantially above prior levels.

The 1985 Farm Bill also included a provision known as the Conservation Reserve Program (CRP). The CRP permits farmers who cultivate fragile soils to retire acreage from production for a 10-year period. In return, they are guaranteed an annual payment from the government; current bids for CRP land run between $50 and $60 per acre. To date, Washington farmers have enrolled 685,275 acres in the program, Oregon farmers 446,779 acres, and Idaho farmers 564,314 acres. And a considerable amount of eligible acreage can still be enrolled into the CRP. Even at current levels of participation, the CRP generates approximately $85 million per year in government payments to regional producers. As this land is taken out of cultivation, the demand in certain rural communities for production inputs and product marketing services declines. Communities that have relied on the economic activity associated with these businesses may find that CRP will result in fundamental changes in their local economies —changes that may exacerbate the effects of the recession in traditional agriculture.

Government programs, in general, mean that individual producers will be able to hang on to their land or continue producing until market conditions improve. Unfortunately, the short- to intermediate-term outlook for traditional agriculture in the Pacific Northwest is not particularly bright. Although livestock prices have recovered somewhat and are stabilizing, prices for grain crops remain low and are not likely to improve significantly in the foreseeable future. Even the decline in the value of the U.S. dollar, combined with the aggressive ex-

Figure 1: 1984 Labor and Proprietor Incomes from Farming, Food Processing, and Agricultural Services
by county



SOURCE: U.S. Bureau of Economic Analysis and Economic Research Service, U.S. Department of Agriculture port promotion programs of the 1985 Farm Bill, has not resulted in a notable increase in grain exports from the Pacific Northwest. Grain stocks remain burdensomely high and have a strong dampening effect on upward price movements in world markets.

Congress is now considering agricultural policy reform that would almost certainly result in decreased benefits to traditional farmers. Most people believe that the federal government cannot continue to pay agricultural producers at current expenditure levels. (On a national basis the cost of government commodity programs has increased from less than $5 billion a year in 1980 to more than $30 billion a year in 1985. In the Pacific Northwest, federal agricultural commodity program costs have increased at nearly twice the national rate.) Commodity programs that result in federal expenditures of $25 billion or more nationally are politically sensitive, given the enormous federal deficit. And many observers believe that the continuation of such payments only forestalls a necessary adjustment in the nation's agricultural capacity.

Agriculture and the Pacific Northwest Economy

As the gulf between the two broad subsectors of agriculture grows and the shift toward less traditional, specialty-crop oriented agriculture continues, the way that agriculture links with and contributes to the broader economy of the region will change. Agricultural producers purchase services, fertilizers, seed, farm machinery, and credit in the region and deliver crops and livestock to regional processors and marketers, who add value to the products before shipping them out of the region. In addition to generating income and employment for the region (Figure 1), direct and related agricultural economic activity contributes to the region's economic critical mass, making other unrelated businesses viable. Without agricultural shipments, for example, traffic on the Snake–Columbia River would not be sufficient to support a waterway transport system. While agriculture dominates riverbound traffic, other industries benefit from low-cost transportation service. The same is true of the Lower Columbia's international ports, which grew up in response to agricultural traffic. They now serve a wide variety of industries in the Pacific Northwest. But agricultural trade remains critical to attracting international transport capacity to the region's ports.

Agricultural trade has served as an entry into a number of Asian markets. Some of the earliest inroads into the Japanese market, during the 1950s and 1960s, were made by U.S. Wheat Associates, the major promotional organization for wheat farmers. Business links developed through those contacts supported and encouraged nonagricultural trade and commercial activity.

Incomes and employment created by agricultural trade, processing, handling, and marketing support regional urban and rural areas. Forty-five percent of total 1985 agricultural sales in Oregon, for example, were in the agriculturally diversified Willamette Valley and Portland metropolitan region, as were 67 percent of the state's agricultural processing employment and 66 percent of the employment in selected agricultural sectors (services, farm machinery and equipment sales, and agricultural credit).

Population and Local Business Impacts

When agricultural production declines markedly, either as a result of short-term or long-term adjustment, communities that once provided trading centers for production inputs and farm outputs find the level of economic activity directly associated with agricultural production dropping as well. Some implement, fertilizer, and pesticide dealers, along with grain elevators and other first market handlers of agricultural commodities, experience a severe drop in business. In many communities certain agriculturally related businesses have disappeared altogether.

Farmers in eastern Oregon, judging from a recent survey, may also be changing their procurement patterns, making major purchases in larger centers at the expense of smaller communities. This same trend is occurring in eastern Washington and in much of Idaho. In Washington's grain-growing area, agricultural service and supply industries appear to be leaving small communities for the Tri-Cities.

Furthermore, the changing economic base, combined with the outmigration of the working age population, makes the provision of many local public services problematic in these subregions. This, in turn, has a dampening effect on development potential.

Population outmigration, particularly of individuals in the 20 to 45 age group, has been substantial in the agriculturally dependent counties and communities. The population age distribution in many rural Oregon communities, for example, has become dominated by the young and the elderly. A similar process is taking place in Washington, where traditional agricultural subregions are losing population to Seattle and Spokane.

While a direct causal link is difficult to establish, the shrinking opportunities in production agriculture and related industries, limited job alternatives, and a general malaise in the economy of the traditional agricultural subregions is at least part of the force driving this population shift. The end result is that traditional agricultural subregions have become increasingly dependent on government transfer payments, associated with agriculture or with retirement incomes, to bring in consumer spending. This leaves communities in these subregions vulnerable to shifts in politics at the national, regional, and state level.

Opportunities to Diversify

The Pacific Northwest is well endowed with resources that create a strong comparative advantage for agricultural production. Thanks to abundant land, plentiful water, and a varied climate, the region can produce a wide range of food and fiber products. This fundamental advantage is not likely to change in the foreseeable future.

Agriculture will adjust and respond to changing economic conditions. During the last seven years, the agricultural economy of the region has, in effect, tilted westward. The diversified agriculture of the western subregions has become increasingly important to the region's economy. At the same time, the traditional agricultural economy has remained sluggish and is increasingly dependent on federal transfer payments.

The long-term outlook for traditional agriculture remains uncertain. Recent trends suggest that specialty-crop agriculture and agricultural processing and marketing are likely to be growth industries in the Pacific Northwest into the next century.

Those areas with the opportunity to diversify toward specialty crops will experience better economic opportunities than those subregions where options are limited to traditional agriculture. In the eastern subregions, the potential for specialty crop development will have a particularly significant impact because of those regions' heavy dependence on agriculture. In the western subregions, specialty crop agriculture will create new opportunities in an already diversified economy. ıllı

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REGION WATCH

Heating System Choices: Fuel and Capital Variables

With the onset of autumn, Pacific Northwest residents again confront the need to clean furnace filters and chimneys, and turn up the thermostats on home heating systems. These rites of fall suggest that it is a good time to consider the question of the economic attractiveness of alternative fuels for home heating. This region is blessed with a number of alternative heating fuels: electricity, natural gas, oil, and wood are all widely used for home heating throughout the Pacific Northwest. Which of these fuels is the most economical? The answer to the question depends on where you live, whether you are thinking about building a new house, undertaking a major renovation of an existing home, or just making low cost modifications to an existing home, and expected fuel prices.

Homeowners must consider both capital and operating costs of home heating systems. Assuming that you live in an area served by a natural gas company and that environmental concerns have not ruled out the option of using wood, the most cost-effective heating system at current prices can be found by analyzing both capital and operating costs of the relevant alternatives.

In the case of new construction, all options are open. A central forced-air furnace can be installed that uses electricity, gas, oil, or wood as the fuel. An electric heat pump can substitute as the heat source in a forced-air system, and baseboard or wall electric units can be placed in each room. Other alternatives, such as floor and ceiling radiant heat systems, exist but will not be considered in this article.

Homeowners remodeling an existing home should certainly consider changing the main furnace in the house if it is old or if the project requires substantially more heat than the old system can provide. An entirely new or updated heating system may make sense in this situation. Existing ductwork can be used, with incremental costs for a new furnace and any added ductwork.

Fuel Costs

Fuel pricing is very complex due to differences in units of measurement and quantity-sensitive prices. Oil prices are quoted per barrel of oil and may vary depending on the quantity the homeowner orders for a single delivery. Wood prices are usually quoted by the cord and vary by species, degree of seasoning, and whether the wood is split, delivered, and stacked. A block pricing structure is used for most electric rates and some gas rates, with an initial block of fuel supplied at one rate, and subsequent quantities supplied at another rate. Some electric and gas utilities also apply a monthly connection or service charge, no matter how much energy is used. Regulated utilities in Idaho apply a minimum charge rather than a service charge; if usage exceeds some minimum level, the homeowner pays only for the energy used, but below that level the minimum charge applies. With each fuel marketed in its own unit of measurement, the prices as quoted per kilowatt-hour (kwh) of electricity, therm of gas, barrel of oil, and cord of wood must be converted into a common unit: British thermal units (Btu).

Table 1: Capital Costs of Home Heating Systems

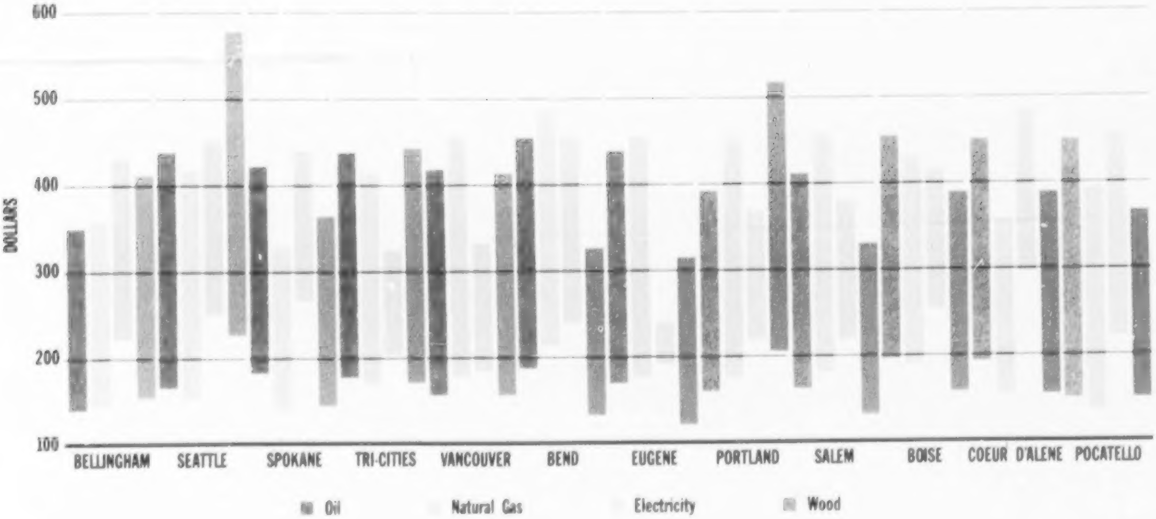
	OIL	WOOD	WOOD-OREGON	GAS	ELECTRICITY
Typical Furnace Purchase Price (Including Ducts if Needed)					
LOW	$2,400.00	$ 500.00	$ 650.00	$2,400.00	$ 500.00
HIGH	3,600.00	3,150.00	3,900.00	3,900.00	3,500.00
Monthly Payment on 30-Year Mortgage at 10-Percent Interest					
LOW	$ 21.06	$ 4.39	$ 5.70	$ 21.06	$ 4.39
HIGH	31.59	26.33	27.64	34.23	30.72
Annual Payment					
LOW	$ 252.74	$ 52.65	$ 68.45	$ 252.74	$ 52.65
HIGH	379.11	315.93	331.72	410.70	368.58

We obtained data on energy costs for a sample of Pacific Northwest cities during the summer of 1987. These are either the prices that were charged during the winter of 1986-87 (wood), current prices for delivery during the summer (oil), or the rates expected to apply during the 1987-88 heating season (electric and gas). These price quotes were then converted into dollars per million Btu.

Just how much space heat can be derived from each Btu of energy delivered to a home depends on the physical efficiency of the heating system. Furnace repairmen typically measure the efficiency of the furnace as part of their diagnostic routine, with results totaling from 60 percent to 95 percent, depending on the vintage and condition of the furnace. This measurement indicates the percent of Btu delivered to the ductwork as a fraction of the Btu in the fuel. Further heat losses are likely in the ductwork used to convey heated air to living spaces in the home. In older homes, losses from uninsulated ducts and leaks at the numerous joints in the ductwork can be substantial. In a review of heating systems studies, Burwell and Phung found that forced-air systems tend to range between 35 percent and 50 percent efficient, even though furnace efficiencies often measured near 75 percent (*Public Utilities Fortnightly*, March 15, 1984, pp. 26-31). In our analysis, we consider overall heating system efficiency and assume a constant home insulation level. Thus, the efficiency range that we consider could be due to variations in furnace efficiency or losses in ductwork.

A final factor to consider in estimating energy costs is climate. Climatic zones in the Pacific Northwest range from coastal areas with mild winters to very severe winters in mountainous regions. A study from the Northwest Power Planning Council by D.S. Parker (January 1987) classifies regional climates into three zones (coastal, inland, and mountain). Based on a sample of more than 800 homes, that study suggests that

Figure 1: Annual Fuel Costs



typical new homes meeting current insulation codes (R-30 ceilings, R-11 walls, double-pane windows, 1600 square feet of floor area) will require the following amounts of energy during typical heating seasons:

ZONE	ANNUAL BTU (MILLIONS)	AREAS IN ZONE
Coastal	**30.297**	**Puget Sound, Portland, Salem, Eugene**
Inland	**33.761**	**Spokane, Tri-Cities, Bend, Boise**
Mountain	**37.325**	**Pocatello**

We have used these assumed annual Btu space heating requirements for each climatic zone to estimate the heating costs shown in Figure 1. There is considerable variation in energy costs around the Pacific Northwest. Taking rate structures, climate, and heating system efficiency into account, oil is the least expensive fuel in Bellingham and in Portland—if the homeowner's heating system has a high efficiency level. Natural gas is more economical in a number of cities, including Seattle, Spokane, and Coeur d'Alene. Gas is the most economical at higher efficiency levels in the Tri-Cities as well. Electric baseboard heat is the clear winner in most of Oregon and when compared to low-efficiency forced-air systems in the Tri-Cities and Vancouver. Finally, wood is the fuel of choice in the southern Idaho cities of Boise and Pocatello.

Capital Costs and Physical Efficiency

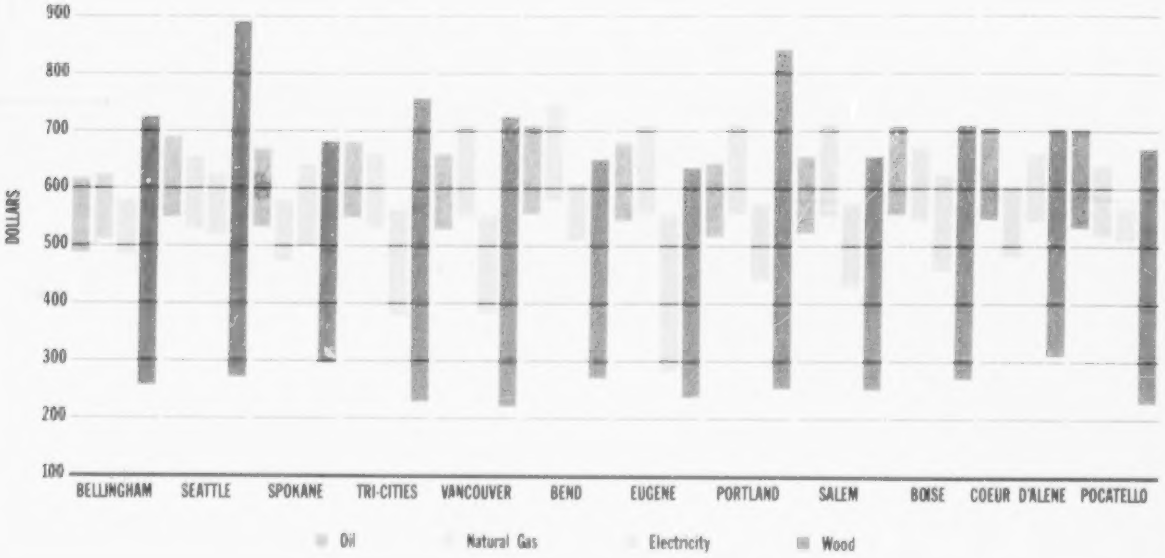
Energy costs, however, are only part of the story. The furnace and any ductwork or tanks are part of the purchase price of a home. These costs vary greatly by type of heating system (Table 1). Electric baseboard heat, which has no ductwork, is the least expensive heating system, except perhaps for wood-fired systems. Electric heat pumps are extraordinarily efficient: they expend X Btu to gather up to 150 × X Btu from an external heat sink, usually the ground outside your house. These systems have a high capital cost for the compressor and require the ductwork of an oil- or gas-fired furnace as well. However, they also function in reverse as air conditioners during the summer months, making them an economical choice for homes that require both heating and cooling. Gas- and oil-fired furnaces tend to be more expensive, and gas systems range higher in price than oil. Wood systems vary greatly in mechanical complexity. At the low end of the range, air-tight wood stoves can be placed in one or more rooms of a home, heating by radiation or passive convection. Depending on the design of the home, a single wood stove can be a practical alternative. At the high end, a forced-air, wood-fired furnace can be installed with the ductwork, thermostatic control, and mechanical complexity of an oil- or gas-fired system.

In this analysis, the initial purchase price of a heating system is financed along with the rest of the home on a 30-year, fixed-rate mortgage at a 10-percent interest rate. The monthly cost of the heating system is multiplied by 12 to obtain the annual capital cost. High and low capital cost estimates, chosen to cover the range between high- and low-efficiency systems, are added to the energy costs to get an estimate of the total costs of space heating (ignoring any periodic maintenance that may be required). In effect, we are assuming that the heating equipment will last for 30 years with little or no maintenance.

Higher efficiency levels are usually associated with a higher initial purchase price. In this analysis, the low capital cost estimate is used for each energy form at the 40 percent and 60 percent efficiency levels for oil, gas, and wood systems, and at the 100 percent efficiency level for electric systems. The high estimate of capital cost is used for the 75 percent efficiency estimates (150 percent for electric heat pumps).

When capital costs are considered, the

Figure 2: Annual Total Heating Costs



complexity and variation depicted in the energy costs estimates in Figure 1 disappear. According to the calculated total heating costs shown in Figure 2, electric baseboard and wood systems are the most economical everywhere in the region—with few exceptions. At high efficiency levels and capital costs, oil is preferred to other heating systems in Bellingham. At the medium to high efficiency levels, natural gas is superior to other heating systems in Seattle. At these medium to high efficiency levels, oil marginally beats electric heat pumps in Eugene. Once capital costs are considered, electricity, a fuel that is more expensive in two of three states, has advantages. And wood, a heat source with very low capital costs for most homes, is the cheapest of all.

Converting to a New Fuel

Furnaces wear out and energy prices fluctuate, prompting many homeowners to consider changing fuel sources. Capital costs associated with the conversion must be added to the fuel costs of the new heating system to determine the most economical option. In the case of an optional conversion designed to minimize heating costs, the total annual costs of the converted system can be compared to the costs of the existing system to see if a change to a new fuel source is economically advisable.

We conducted such an analysis for our sample of Pacific Northwest cities and found that electric and wood systems are the most economical conversions in much of the Northwest. In some locations, converting suitable oil furnaces to gas by installing a leased gas burner is technically and economically feasible. The substantial capital costs of other conversions, such as gas to oil or electric to gas, make such conversions uneconomical in most locations.

Caveats

Several additional qualifications must be made. The wood heating cost estimates are the least certain in this analysis. The design of the house will dictate how large your investment in stoves or furnaces will be. Multilevel, open designs can be adequately heated with simple radiation or convection systems. Homes with floor-to-ceiling walls, forming rooms sealed off with doors, will require more expensive forced-air systems. There are also environmental considerations with wood that do not apply to other heating systems. Our estimates, for example, include the cost of the catalytic converters required by Oregon State law. That additional cost had no impact on the results; wood is still less expensive. However, catalytic converters may not be the only complication in the conversion to wood heat. Bans on burning at some or all times of the year would likely follow an attempted mass conversion. In addition, wood is an inconvenient heating fuel. Stoves or furnaces must be stoked every hour or two, temperature regulation is not precise, ashes must be removed about once a day, and chimneys must be cleaned one or more times per heating season.

Electric baseboard heat is also criticized as an unsafe system; wall units can be the source of house fires or injuries. There is also a tendency to regard baseboard units as "cheap" systems that should be be avoided in higher quality housing. Systems that heat water or oil rather than air and then heat air by radiation or convection are available, mitigating the safety issue without destroying the economic advantage of electric heat.

Homeowners analyzing heating costs can obtain data on current energy costs. The future of energy prices is highly uncertain, and homeowners should bear in mind that energy prices will surely change and will change relative to each other. Systems that minimize capital costs—simple wood stoves or electric baseboard units—have the advantage of low fixed costs. In an uncertain world in which fuel prices fluctuate according to international supply and demand, there is an advantage to minimizing fixed costs so that the homeowner can switch to an alternative fuel down the road.

The Circular Flow Model of the Washington Economy

by Stephen J. Rose

Economic models usually take the form of abstract equations and computer simulations, which are not accessible to or easily understood by people other than economists. The graphic model shown on the following pages portrays major flows of labor, goods, and money in a form that links the production, income, and government sectors of the economy. The model is also intended to convey to readers a sense of the relative magnitudes of the various flows in the economy. Although models of this kind exist for the United States, the Washington circular flow model is the only state model to date.

The presentation of economics as a circular flow of goods, labor, and money has a long history. Francois Quesney, an 18th-century French economist of the Physiocrat School, originated the idea of a *tableau economique*, which traced the flow of trade between agriculture and industry.

A circular flow approach to the economy represents a summary of economic relationships. Whether people get what they want out of the process and how the process is initiated are not part of this picture. In fact, there is a certain chicken-or-egg quality to market economies. In order for products to be sold, people need money in hand; they get most of this money as payment for work; employers generate the revenue to pay workers by selling products. So sales require purchasing power derived from sales.

This theoretical dilemma is usually not a real-life problem because businesses start with financial and physical assets accumulated from previous production cycles. They then advance money for the production of goods that will be sold in the future while supplying today's market by selling inventory. What they are producing now replenishes stocks and, thus, the process continues.

Adam Smith, the 18th-century English philosopher and economist, prophesied that capitalism would function effectively by relying on people working hard in their own self-interest. He argued that each person's efforts would work through an "invisible hand" to advance the common interest. Bernard Mandeville, another early economist, doubted that this principle would always apply and countered that private vices (greed defined as self-interest) would not always lead to public virtue (strong economic growth fostering the common good). Mandeville and many others since have wondered how the common good is defined—given the inequalities of wealth, income, and opportunity. In response to the practical consequences of some people abusing their power by taking advantage of others, a series of reforms have been adopted, primarily in the form of government programs, which provide some measure of security for those at the bottom and slightly limit the power of those at the top. The size of the government sector on the diagram represents the current balance between public and private interests.

The Circular Flow Model

The diagram on the following pages takes a first, visual step in simplifying and disentangling the economic flows within and outside Washington State. It presents the economy as a basic four-step process. Beginning with the wealth accumulated from earlier production processes, the circular flow includes production, market exchanges, and consumption. Money is the medium through which all these various exchanges pass; it flows throughout the chart and ties the various elements together. Sales in the marketplace provide the necessary income flows to business, the government, and consumers, which in turn permits the next stage of production to occur and the next round of sales to take place.

The diagram, like the state economy, is based on the production and consumption of goods and services, and on the generation and expenditure of income. Businesses, households, and government stand out clearly as the major sectors through which the various interconnecting arrows of the diagram travel. The different colors on the diagram represent three major dimensions of the economy: labor expended, products produced and sold, and money. The relative sizes of the bands reflect how we chose to use our economic resources in 1985, choices that resulted from the separate decisions of consumers, business, and government. The symmetry of circular flows ensures that the value of this output equals the value of the money flowing to people, government, and business.

The economic process begins (at the far left of the diagram) with the existing stock of machines, tools, buildings, and inventories. Labor is applied to these to produce gross state product, which exists in the form of services and production. About 5.9 percent of gross product consists of net exports to the rest of the United States or to foreign countries. The remaining 94.1 percent is sold to consumers (67.5 percent), government (13.6 percent), and business investors (13 percent) within Washington.

Consumers, called "The Population," make purchases in the form of transportation services, housing, medical services, food and clothing, and personal upkeep and amusement. To pay for these, the population uses personal income, which is made up of wages earned from labor, transfer payments, and interest, dividends, and rents. It should be noted that a number of activities are not part of this economic accounting. For example, child care, household upkeep, and volunteer activities are all excluded. More than two-thirds of the labor expended on market activities fall into these categories and is represented on the diagram

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The diagram and text were developed by Stephen J. Rose, who is the budget and policy analyst of the Washington State Senate Ways and Means Committee and the author of American Profile Poster *and* The American Economy Poster and Factbook. *The information for the circular flow model is derived from* The Washington State Input-Output Study for 1982, *by Philip Bourque of the University of Washington. If numbers for the state were not available, estimates were based on the national income and products accounts.*

The Washington Circular Flow Model

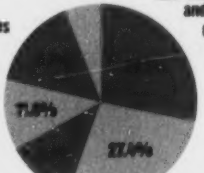
Washington State Senate Ways and Means Committee Report, Marcus Gaspard, Chair

The central horizontal band represents the stages through which goods and services pass as they are produced and consumed. Beginning with existing technology and infrastructure, businesses and governments hire workers and purchase inputs to produce outputs for individual consumption, public services, and investment. The large arrows representing imports and exports show that the state's economy relies heavily on trading with the rest of the United States and other countries. In the marketplace, each of these outputs is matched with a countervailing flow of money; gross purchases equal gross sales.

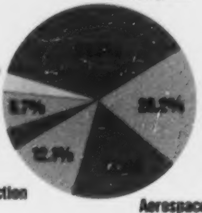
This chart is called a circular flow diagram because the sale of goods and services provide the incomes to purchase these items. On the diagram, the dollar arrow representing total sales divides into components that flow into businesses, government, and the population. The arrow for labor compensation (wages, salaries, and benefits) circles the central production band; businesses and government get the money to pay workers from a portion of the receipts of market sales.

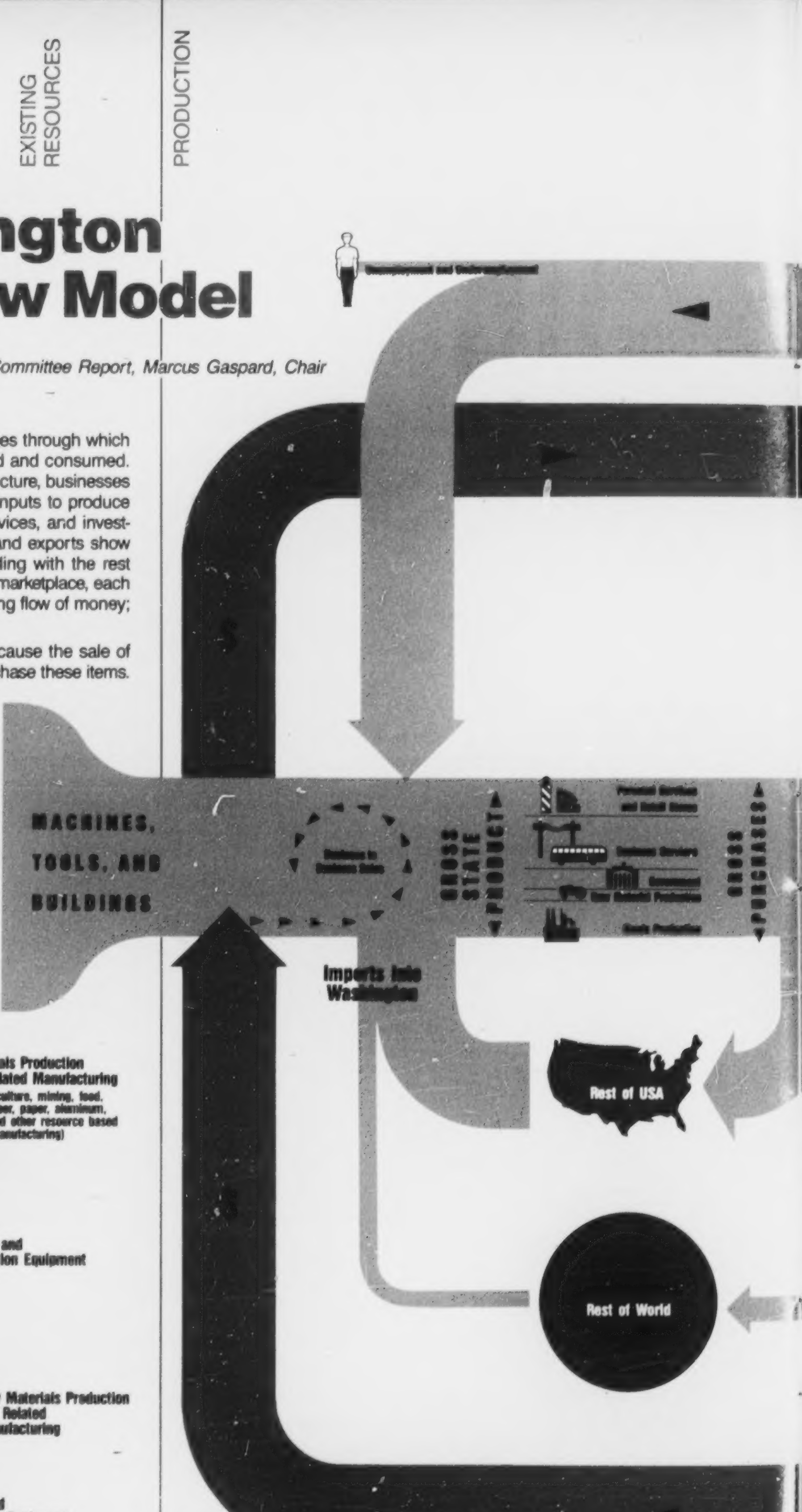
This diagram was adapted by Stephen J. Rose from his book, The American Economy Poster and Factbook. The symbols and text are copyrighted and used with the permission of Pantheon Books.

DISTRIBUTION OF STATE EXPORTS



DISTRIBUTION OF STATE IMPORTS




EXISTING RESOURCES
PRODUCTION
Unemployment and Underemployment
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MACHINES, TOOLS, AND BUILDINGS
Business to Business Sales
GROSS STATE PRODUCT
Personal Services and Retail Stores
Business Services
Government
Raw Materials Production
Goods Production
GROSS PURCHASES
Imports into Washington
Rest of USA
Rest of World
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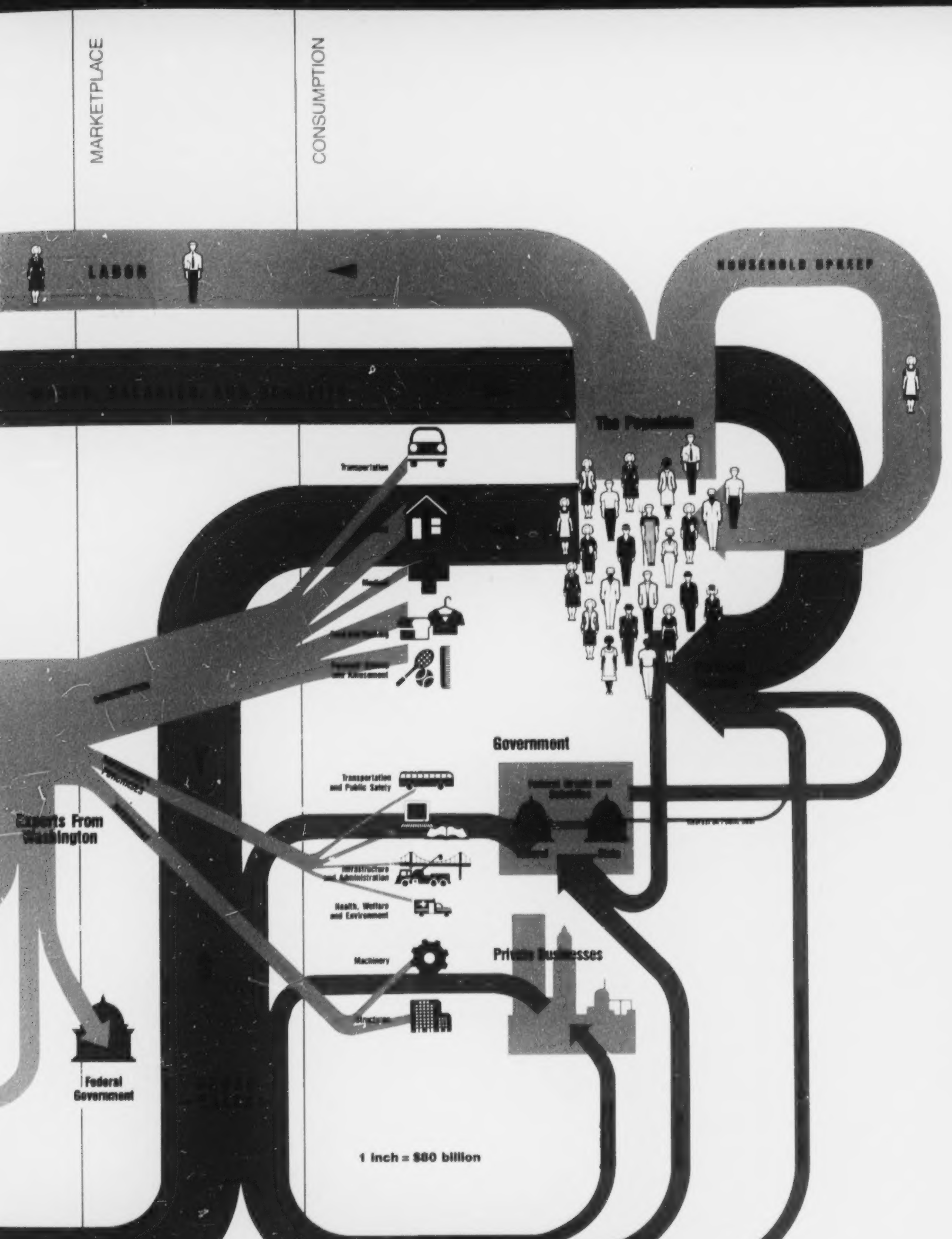
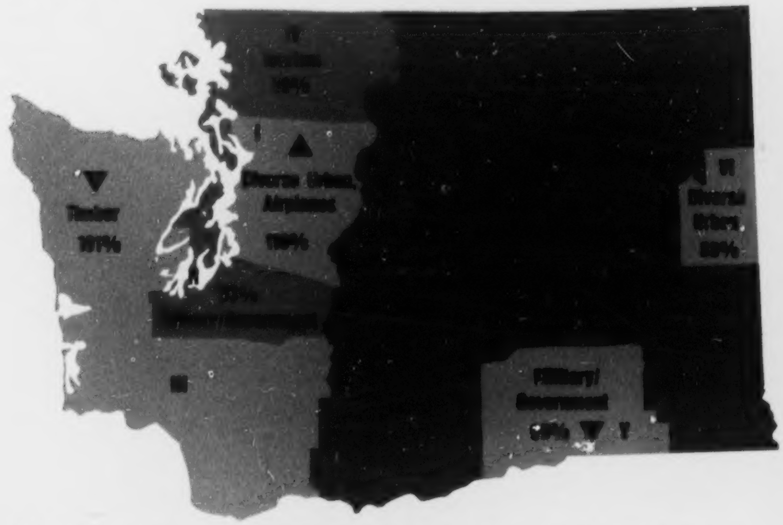

MARKETPLACE
CONSUMPTION
LABOR
HOUSEHOLD UPKEEP
The Population
Transportation
Medical
Government
Transportation and Public Safety
Infrastructure and Administration
Health, Welfare and Environment
Machinery
Private Businesses
Structures
Experts From Washington
Federal Government
1 inch = $80 billion

Figure 1: Per Capita Income as a Percent of State Average



▲ Per capita income increased relative to state average in this region in the last 10 years.
▼ Per capita income decreased relative to state average in this region in the last 10 years.

Region I:
King and Snohomish

Region II:
Pierce, Kitsap, and Thurston

Region III:
Clallum, Jefferson, Mason, Grays Harbor, Pacific, Lewis, Wahkiakum, Cowlitz, Clark, and Skamania

Region IV:
Island, San Juan, Skagit, and Whatcom

Region V:
Benton, Franklin, and Walla Walla

Region VI:
Spokane

Region VII:
Pend Oreille, Stevens, Ferry, Okanogan, Chelan, Douglas, Lincoln, Grant, Kittitas, Adams, Yakima, Klickitat, Whitman, Asotin, Garfield, and Columbia

by a labor arrow that exits and then loops back into the population sector.

Government purchases flow into transportation and public safety, education, infrastructure and administration, and health, welfare, and environment. To pay for purchases, the government receives money from business and personal taxes. Our state and local governments also receive substantial grants and transfers from the National Treasury.

Investment takes the form of machinery and structures, which is paid for by depreciation charges, retained earnings, and business borrowing (not shown on the diagram).

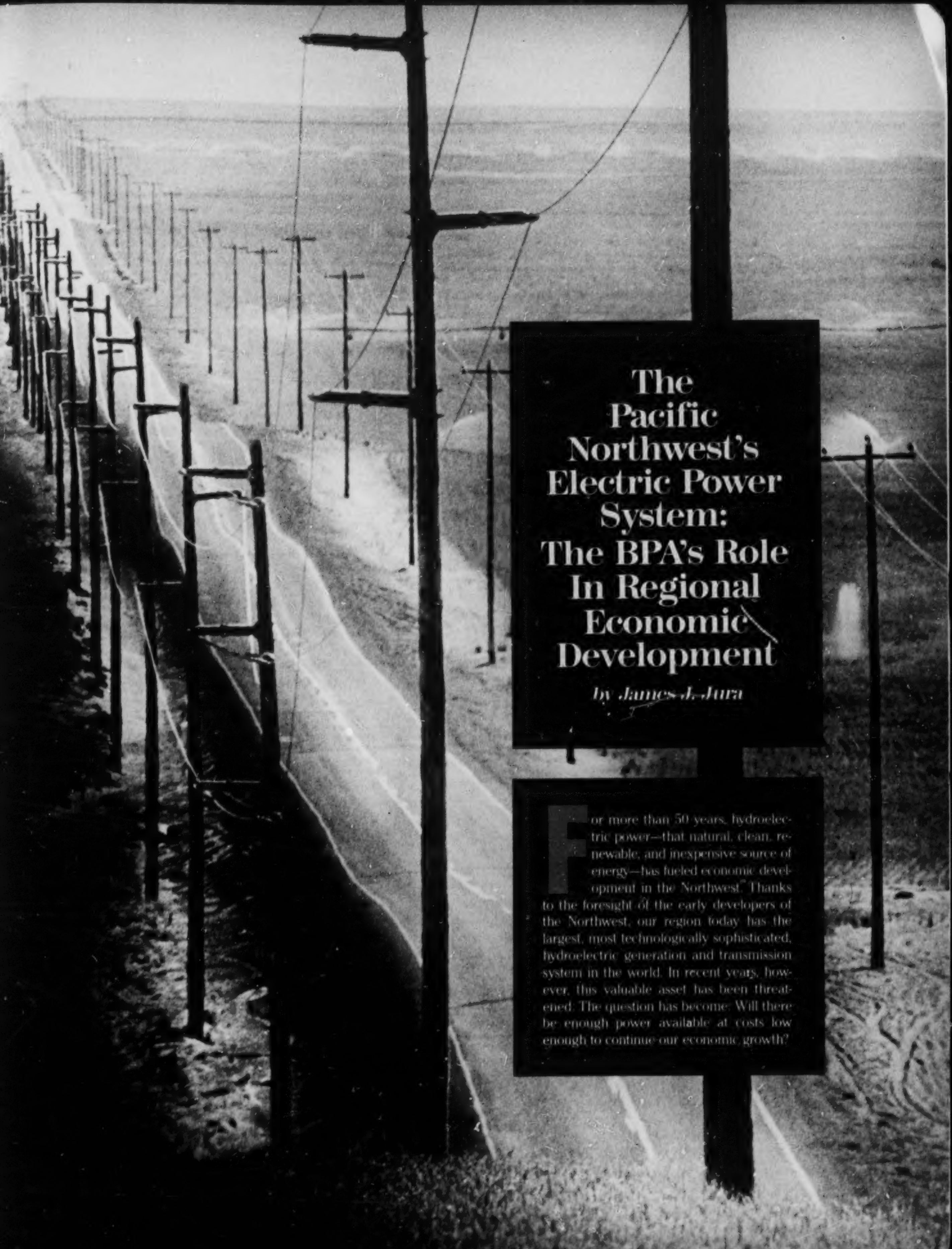
At the state level, the economy is much less self-sufficient than is the national economy. We specialize in producing certain goods (airplanes, timber, hops, etc.) and trade these products for a broad range of consumer goods and needed producer inputs that are not locally available. This can be seen on the diagram in the large arrows representing state imports and exports. Each of these flows is more than 60 percent of gross state product; in fact, recent research has shown that Washington State does relatively more exporting to foreign countries than any other state. On the national level, imports and exports are each less than 10 percent of gross national product.

The diagram also displays two pie charts that show the distribution of state imports and exports by industry. Only 37 percent of the products we import are for consumers. While most people know that the Boeing Company sells virtually all of its products outside Washington, for example, few people know that Boeing also buys most of its inputs from manufacturers outside of the state (62 percent of its sales are due to passing along the costs of inputs bought from non-Washington suppliers).

Figure 1 depicts variations within Washington and divides the state into seven regions. The colors on this diagram show each area's per capita income relative to the state's average in 1985, while the numbers give the exact ratio. Accompanying arrows either point up or down to show the movement of per capita income relative to the state average in the last 10 years. A short description of the economic base of each region is also included on the figure. Incomes in Washington have grown slowly during this time period, relative to national trends. The arrows on the map refer only to movement of each area versus the state average. Table 1 lists each area's relative employment composition.

Table 1: Relative Employment Composition by Region

	REGIONS	I	II	III	IV	V	VI	VII	STATE AS A WHOLE
EMPLOYMENT	Raw Materials Production and Related Manufacturing	4.1%	7.1%	21.1%	22.1%	18.9%	6.9%	23.7%	10.9%
	Aerospace and Transportation Equipment	18.2%	0.6%	0.9%	0.7%	0.0%	0.8%	0.4%	5.7%
	Other Goods Production	10.6%	6.5%	10.3%	9.7%	10.7%	12.3%	5.4%	10.2%
	Business Services	30.5%	28.6%	17.1%	17.1%	21.6%	28.7%	17.2%	25.1%
	Personal Services and Retail	31.3%	34.1%	32.0%	36.5%	28.2%	38.3%	27.7%	32.0%
	Government	13.1%	20.6%	18.9%	18.0%	17.9%	15.8%	20.6%	17.9%



The Pacific Northwest's Electric Power System: The BPA's Role In Regional Economic Development

by James J. Jura

For more than 50 years, hydroelectric power—that natural, clean, renewable, and inexpensive source of energy—has fueled economic development in the Northwest. Thanks to the foresight of the early developers of the Northwest, our region today has the largest, most technologically sophisticated, hydroelectric generation and transmission system in the world. In recent years, however, this valuable asset has been threatened. The question has become: Will there be enough power available at costs low enough to continue our economic growth?

A Difficult Period

The last 10 years have been difficult ones for the Bonneville Power Administration (BPA), its customers, and the region's electric utilities. Rising rates, expensive and delayed thermal generating projects, and a stagnant demand for power have threatened the financial solvency of the BPA, many of its wholesale customers, and a number of utilities in the region. The thrust of the 1970s was to develop new resources to meet fast growing, but frequently inefficient, new loads. In response to the perceived energy deficits and with the expectation that increasing energy demands and prices would continue, a consensus of regional interests put through the Pacific Northwest Electric Power Planning and Conservation Act. Passed in 1980, this act brought us new programs to conserve energy, develop more efficient resources, and protect and mitigate the fish and wildlife of the region. It also mandated a new planning mechanism for the region with, at its center, the Pacific Northwest Electric Power Planning Council.

The act worked well, but the expected load increases didn't materialize, and the result has been a regional power surplus. International competition in the aluminum industry forced aluminum customers to cut back their production, which led to significantly lower revenues and loads for BPA. As the rest of the region slipped into difficult economic times, regional utilities found themselves with decreasing load growth. Our extraregional markets, particularly those in California, also declined, primarily from the pressure of low-cost oil and gas price competition. The drop in revenues in 1986, for example, was in excess of $300 million. At the same time, the Northwest was becoming more efficient in its use of electric power. The surplus continued to grow.

COURTESY OF BONNEVILLE POWER ADMINISTRATION

In the early 1980s, we had to scrap plans for new thermal generating plants to cut our losses in those projects. The Washington Public Power Supply System (WPPSS) terminated two projects and moth-balled two more. BPA and the region's public and private utilities have had to cope with large debts and debt service costs from uncompleted power facilities, and these debts have forced our rates upward. So today we are faced with a very real power surplus in the region, at the same time that revenues have fallen and new financial responsibilities have been added. These circumstances, greatly changed from the 1978-80 period when the act was drafted, have led us to review and rethink our plans and assumptions, and develop new strategies.

The Elements of Future Growth

To have a reliable power system that will continue to be strong and competitive and yet can support and stimulate future economic growth in the region, three elements are essential. First, we must control our costs and curb our appetite for regional spending programs. Further spending will not stimulate economic growth if our power costs are noncompetitive. And far too much of BPA's revenue ($1.5 billion in FY1986) is being sent out of the region to service past debt.

We need, second, to agree to a cohesive, long-term energy plan that gives us the flexibility to solve our immediate needs while we take action on our future, permanent power system requirements. In this effort, the Planning Council must provide the leadership and Northwest utilities, governments, customers, consumers, and environmental and energy interests must participate in developing and following the plan.

Third, we must become better salespeople and market our products and regional advantages more effectively. In power marketing, BPA and the region's utilities have introduced a number of innovations to spur the sales of electrical energy and take advantage of the power surplus—variable rates, discount rates, surplus block sales—with some success. We can and must do more.

The cost-reduction phase of this program has been under way the past two years. BPA has sharply reduced its program levels, improved efficiencies in operations and management, and postponed a variety of program expenditures that could be delayed prudently. Future spending plans for the 1987-89 period have been cut by $850 million. The 1987 reduction, for example, is $363.5 million. BPA is also undergoing its first major agency-wide reorganization in more than two decades, more than 250 jobs —7 percent of the work force—are being eliminated, divisions and branches within the BPA are being consolidated, and programs nonessential to our primary energy functions are being reduced or eliminated.

The marketing changes in our program have also been under way for months. BPA has been working closely with its customers to provide new markets for Northwest electricity and has developed and offered a number of industrial and other energy-use incentive programs. We believe that, working in close partnership with state governments, entrepreneurs, management, and labor, we have achieved some success in assisting our regional aluminum industry, stabilizing energy loads, and making them more efficient. But these marketing efforts have been planned as more than just an immediate answer to our current problems—they are a transition into the future. They will stabilize and enhance BPA's revenues during the surplus period and beyond. By establishing efficient new loads and strengthening our existing loads, we will reduce the volatility in the rates that BPA charges and the revenues that it obtains from its regional customers. This will not only make us more competitive, it will reduce our dependency on extraregional markets.

"The Bonneville Partnership"

Our seven new marketing programs were designed during 1986-87 and offered in June and July 1987. We have named them "The Bonneville Partnership," because the programs depend on the involvement of others for their success. We need the active participation of our customers, the support of state and local governments, inclusion in the Planning Council's plan, and full coordination with the other projects within the region.

- **Special Rates for New and Expanding Industries.** Our local utility customers are offering qualifying industrial consumers two rate options: a rate stability alternative that fixes the wholesale power price, or its rate of increase, for that consumer for a period of up to 10 years, or a three-year discount on BPA's current wholesale rates, which can be arranged to fit special circumstances. These rates will encourage the development and expansion of manufacturing activity and focus on rate stability—a key economic development factor stressed by many of our customers.
- **Incentives for Activating Idle Capacity.** To preserve and stabilize existing Northwest industrial operations and loads, utilities participating with BPA are offering their eligible business consumers alternatives for reducing their electricity costs. These include a three-year declining discount rate, a take-or-pay fixed discount from our current wholesale rate, or the rebate of a portion of the business consumer's monthly electricity bill—a rebate that the consumer will use for capital improvements.
- **Industrial Technical Assistance.** Our utility customers want to work effectively with their industrial consumers on long-term technical and process improvements. To assist the utilities, BPA is offering local, regional, and national technical resources to provide advice, assistance, and information on advanced electric technologies with industrial applications.
- **Commercial Design Assistance.** Through this program, BPA is providing technical support to designers and developers of new commercial facilities to help them choose efficient and productive energy-using equipment and construction techniques.
- **Incremental Load Program.** This flexible program allows participating utilities to experiment, under certain conditions, with discounted surplus electricity (or other types of incentives) in projects that could result in the future use of additional surplus electricity.
- **Incentives for Wood Heat Displacement.** Under certain conditions, BPA is offering wholesale electricity at a discount to aid eligible utilities' efforts to regain the sales share lost to wood heat. This program also will benefit communities in which wood smoke has led to air-quality deterioration.
- **Special Rates to Prevent Business Closure.** Through this program, BPA is offering special wholesale electricity rates to eligible utilities. These utilities can then pass the savings on to industrial facilities that can demonstrate that reduced energy costs will ensure their continued operation.

At BPA, we don't believe that these programs can solve all of the region's economic woes. We recognize that there are other significant factors in economic decision-making that far outweigh energy costs. These programs do, however, represent a sincere commitment on BPA's part to address our economic difficulties and work with our wholesale customers and other utilities to support economic development.

Reunification and Technological Advances

While these marketing initiatives will provide visible measures of our load rebuilding effort, an equally significant aspect of BPA's commitment will be the reconstruction of the unity of interests that is needed to ensure our future energy base, economic growth, and prosperity. In the long-term, this reunification of interests may be more important to the region's future than the development of our regional hydroelectric system.

Press accounts have described recent disputes over intertie access and related issues between utilities and among electric customer groups in the region. They've reported that a number of utilities are looking outside the region for new energy sources, even while other regions are looking for a greater share and control of our Northwest power resources. And they have reported growing competition and rivalry between public and private power interests over sources of generation and markets inside and outside the region.

Continued disunity will not serve the Northwest's interests, for it creates the possibility that energy consumers outside the Pacific Northwest will receive benefits to which they are not entitled. The Bonneville Power Administration is committed to supporting a major reunification effort among the utilities, governments, and energy interests to develop a regional consensus on intertie access policy. This effort will involve the Planning Council and the diverse parties and interests that share a stake in the future of our regional power system. Its success is contingent on their willingness to participate in discussions of mutual interests and find a common ground.

Another important aspect of our future development is our vigilance and attention to technological improvements and advances. BPA will monitor the innovations and improvements that can contribute to our growth by increasing the availability, marketability, and environmental acceptability of electricity to meet future needs and demands. Superconductivity and other technological advances could have major impacts on the electric industry—and our economic growth and prosperity—by significantly increasing energy supplies or reducing costs.

In years past, our major resource programs were concentrated largely on acquiring new central-station generating plants. We now believe that new technology and improvements in generation and transmission efficiencies may be key to our role in the future. And, thanks to our existing surplus and our continuing conservation efforts, we now have the time necessary for careful review and analysis.

The future, then, will be shaped by what we can achieve through cooperative planning efforts based on the unity of interests that we have in our regional power system. And it is significant that the future energy needed to achieve regional economic growth and prosperity will be a product of the hydroelectric system that we have in place and in operation today.

This year BPA observed its 50th anniversary. As important as the federal power system and our other regional hydroelectric projects were at their inception and during their early years, their role in the future of the Pacific Northwest has probably never been more significant than it is now. And the role that our hydroelectric power system will play in the future, our economic growth and prosperity, will depend not only on the success of the BPA in its efforts to overcome its current problems, but even more on the cooperative and unified efforts of all the region's utilities and energy interests to perceive and properly exploit its value.

James J. Jura was appointed administrator of the Bonneville Power Administration in July 1986. He attended the University of Washington and Seattle University, where he received an MBA while working for The Boeing Company. He later spent five years with the Office of Management and Budget in Washington, D.C.

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